

10/584367

AP20 Rec'd PCT/PTO 23 JUN 2006

SEQUENCE LISTING

<110> Imperial College Innovations Limited
 <120> Vaccines

<130> ICOBW/P32315PC

<141> 22/12/04

<150> 0330007.6

<151> 23/12/03

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<212> DNA

<213> Neisseria meningitidis serogroup B NMB0341 (TspA) DNA sequence

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<212> PRT

<213> Neisseria meningitidis serogroup B NMB0341 (TspA) protein sequence

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 465 470 475 480
 Asp Ser Leu Ala Ala Ala Gln Asn Gly Ile Leu Ser Gly Ala Leu Thr
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35          40          45

Gly Val Phe Ile Tyr Gly Ala Asn Met Lys Leu Ile Tyr Thr Val Ile
50          55          60

Lys Ile Ile Ile Leu Leu Leu Phe Leu Leu Leu Ala Val Ile Asn Thr
65          70          75          80

Asp Ala Val Thr Phe Ser Tyr Leu Pro Gly Gln Lys Phe Asp Leu Pro
85          90          95

Leu Ile Val Val Leu Phe Gly Ala Phe Val Val Gly Ile Ile Phe Gly
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Met Phe Ala Leu Phe Gly Arg Leu Leu Ser Leu Arg Gly Glu Asn Gly
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35 40 45

His Gln Tyr Glu Arg Gly Trp Phe Thr Ser Met Glu Thr Thr Val Ile
50 55 60

Arg Leu Lys Pro Glu Leu Leu Asn Asn Ala Arg Lys Tyr Leu Pro Asp
65 70 75 80

Asn Leu Lys Thr Val Leu Glu Gln Pro Val Thr Leu Val Asn His Ile
85 90 95

Thr His Gly Pro Phe Ala Gly Gly Phe Gly Thr Gln Ala Tyr Ile Glu
100 105 110

Thr Glu Phe Lys Tyr Ala Pro Glu Thr Glu Lys Val Leu Glu Arg Phe
115 120 125

Phe Gly Lys Gln Val Pro Ala Ser Leu Ala Asn Thr Val Tyr Phe Asn
130 135 140

Gly Ser Gly Lys Met Glu Val Ser Val Pro Ala Phe Asp Tyr Glu Glu
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Leu Ser Gly Ile Arg Leu His Trp Glu Gly Leu Thr Gly Glu Thr Val
165 170 175

Tyr Gln Lys Gly Phe Lys Ser Tyr Arg Asn Gly Tyr Asp Ala Pro Leu
180 185 190

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Phe Lys Ile Lys Leu Ala Asp Lys Gly Asp Ala Ala Phe Glu Lys Val
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His Phe Asp Ser Glu Thr Ser Asp Gly Ile Asn Pro Leu Ala Leu Gly
210 215 220
Ser Ser Asn Leu Thr Leu Glu Lys Phe Ser Leu Glu Trp Lys Glu Gly
225 230 235 240
Val Asp Tyr Asn Val Lys Leu Asn Glu Leu Val Asn Leu Val Thr Asp
245 250 255
Leu Gln Ile Gly Ala Phe Ile Asn Pro Asn Gly Ser Ile Ala Pro Ser
260 265 270
Lys Ile Glu Val Gly Lys Leu Ala Phe Ser Thr Lys Thr Gly Glu Ser
275 280 285
Gly Ala Phe Ile Asn Ser Glu Gly Gln Phe Arg Phe Asp Thr Leu Val
290 295 300
Tyr Gly Asp Glu Lys Tyr Gly Pro Leu Asp Ile His Ile Ala Ala Glu
305 310 315 320
His Leu Asp Ala Ser Ala Leu Thr Val Leu Lys Arg Lys Phe Ala Gln
325 330 335
Ile Ser Ala Lys Lys Met Thr Glu Glu Gln Ile Arg Asn Asp Leu Ile
340 345 350
Ala Ala Val Lys Gly Glu Ala Ser Gly Leu Phe Thr Asn Asn Pro Val
355 360 365
Leu Asp Ile Lys Thr Phe Arg Phe Thr Leu Pro Ser Gly Lys Ile Asp
370 375 380
Val Gly Gly Lys Ile Met Phe Lys Asp Met Lys Lys Glu Asp Leu Asn
385 390 395 400
Gln Leu Gly Leu Met Leu Lys Lys Thr Glu Ala Asp Ile Arg Met Ser
405 410 415
Ile Pro Gln Lys Met Leu Glu Asp Leu Ala Val Ser Gln Ala Gly Asn
420 425 430
Ile Phe Ser Val Asn Ala Glu Asp Glu Ala Glu Gly Arg Ala Ser Leu
435 440 445
Asp Asp Ile Asn Glu Thr Leu Arg Leu Met Val Asp Ser Thr Val Gln
450 455 460
Ser Met Ala Arg Glu Lys Tyr Leu Thr Leu Asn Gly Asp Gln Ile Asp
465 470 475 480
Thr Ala Ile Ser Leu Lys Asn Asn Gln Leu Lys Leu Asn Gly Lys Thr
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<213> Neisseria meningitidis serogroup B NMB0738 DNA sequence

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gttacggtcg ccacgggtt caggggagga cagcaccggt cgggtctatat tgtcgaaaaa 780
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35 40 45

Asp Glu Thr Glu Leu Ala Val Ser Val Asp Val Arg Ser Gly Ile Asp
50 55 60

Ile Gly Gln Ala Arg Glu Gln Ile Ala Ser Leu Arg Arg Leu Gly His
65 70 75 80

Arg Val Glu Val Leu Phe Val Glu Ala Glu Glu Ser Val Leu Val Arg
85 90 95

Arg Phe Ser Glu Thr Arg Arg Gly His Pro Leu Ser Asn Gln Asp Met
100 105 110

Thr Leu Leu Glu Ser Leu Lys Lys Glu Arg Glu Trp Leu Phe Pro Leu
115 120 125

Lys Glu Ile Ala Tyr Cys Ile Asp Thr Ser Lys Met Asn Ala Gln Gln
130 135 140

Leu Arg His Ala Val Arg Gln Trp Leu Lys Val Glu Arg Thr Gly Leu
145 150 155 160

Leu Val Ile Leu Glu Ser Phe Gly Phe Lys Tyr Gly Val Pro Asn Asn
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 Ala Asp Phe Met Phe Asp Met Arg Ser Leu Pro Asn Pro Tyr Tyr Asp
 180 185 190
 Pro Glu Leu Arg Pro Tyr Thr Gly Met Asp Lys Pro Val Trp Asp Tyr
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 Leu Asp Gly Gln Pro Leu Val Gln Glu Met Val Asp Asp Ile Glu Arg
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 Phe Val Thr His Trp Leu Pro Arg Leu Glu Asp Glu Ser Arg Ser Tyr
 225 230 235 240
 Val Thr Val Ala Ile Gly Cys Thr Gly Gly Gln His Arg Ser Val Tyr
 245 250 255
 Ile Val Glu Lys Leu Ala Arg Arg Leu Lys Gly Arg Tyr Glu Leu Leu
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 Ile Arg His Arg Gln Ala Gln Asn Leu Ser Asp Arg
 275 280

<210> 9
 <211> 1416
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0792 DNA sequence

<400> 9
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 ttccggcattt accacatcct gccttacagc cccgatgcc aataaaggat cgcgctgctg 180
 attttcgttg ccgcactttg gtttacccag gccgtccaca ttaccgtaac cgcactgatg 240
 gtgcgcgattc tcgccgtcgt actcggtttc cccgacatgg acatcaaaaa ggcgatggct 300
 gattttttcca acccgattat ctacattttt ttccggcggct tcgcgcttgc caccgccctg 360
 catatgcagc ggctggaccg taaaatcgcc gtcagcctgt tgcgcctgtc gcgcggcaat 420
 atgaaagtgg cggttttgat gttgttcctc gttaccgcct ttctgtccat gtggatcagc 480
 aacaccgccca ccgccgcgat gatgctgcct ctagcaatgg gtatgctgag ccacctcgac 540
 caggaaaaag aacacaaaaac ctacgtcttc ctctgtctcg gcacgccta ttgcgccagc 600
 atcggcgggct tgggcacgct cgtcggctcg ccgcccaacc tgattgccgc caaagcccta 660
 aatctggact tcgtcggctg gatgaagctc ggcctgccga tgatgctgtt gattctgccc 720
 ttgatgctgc tctccctgta cgtcatcctc aaacctaatt tgaacgaacg cgtggaaatc 780
 aaagccgaat ccatcccttg gacgtgcac cgcgtgatcg cgctgttgat ttctcttgcc 840
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 gacaccgtta tcgccctgag tgccgcgctc gccgtcgtcg tcttcggcgt ggcgcaatgg 960
 aaggaagtgc cccgcaatac cgactggggc gtgttgatgc tcttcggcgg cggcatcagc 1020
 ctgagcacgc tgttgaaaac atccggcgcg tccgaagcct tgggacagca ggttgccgcc 1080
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 atcgctatgc agatggggct gccgaacaa gtcttggtat tcgtcatcgg catcggcgca 1260
 tcttgctgct tcatgctgcc ggttgccaca ccgcctaacg cgattgtgtt cggcacgggc 1320
 ttaatcaagc aacgcgaaat gatgaatgtc ggcatactgc tgaacatcct ctgcgtagta 1380
 ttggttgctc tgtgggctta tgctgtactg atgtaa 1416

<210> 10
 <211> 471
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0792 protein sequence

<400> 10

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 20 25 30
 Thr Ile Ile Ser Ala Val Val Cys Phe Gly Ile Tyr His Ile Leu Pro
 35 40 45
 Tyr Ser Pro Asp Ala Asn Lys Gly Ile Ala Leu Leu Ile Phe Val Ala
 50 55 60
 Ala Leu Trp Phe Thr Glu Ala Val His Ile Thr Val Thr Ala Leu Met
 65 70 75 80
 Val Pro Ile Leu Ala Val Val Leu Gly Phe Pro Asp Met Asp Ile Lys
 85 90 95
 Lys Ala Met Ala Asp Phe Ser Asn Pro Ile Ile Tyr Ile Phe Phe Gly
 100 105 110
 Gly Phe Ala Leu Ala Thr Ala Leu His Met Gln Arg Leu Asp Arg Lys
 115 120 125
 Ile Ala Val Ser Leu Leu Arg Leu Ser Arg Gly Asn Met Lys Val Ala
 130 135 140
 Val Leu Met Leu Phe Leu Val Thr Ala Phe Leu Ser Met Trp Ile Ser
 145 150 155 160
 Asn Thr Ala Thr Ala Ala Met Met Leu Pro Leu Ala Met Gly Met Leu
 165 170 175
 Ser His Leu Asp Gln Glu Lys Glu His Lys Thr Tyr Val Phe Leu Leu
 180 185 190
 Leu Gly Ile Ala Tyr Cys Ala Ser Ile Gly Gly Leu Gly Thr Leu Val
 195 200 205
 Gly Ser Pro Pro Asn Leu Ile Ala Ala Lys Ala Leu Asn Leu Asp Phe
 210 215 220
 Val Gly Trp Met Lys Leu Gly Leu Pro Met Met Leu Leu Ile Leu Pro
 225 230 235 240
 Leu Met Leu Leu Ser Leu Tyr Val Ile Leu Lys Pro Asn Leu Asn Glu
 245 250 255
 Arg Val Glu Ile Lys Ala Glu Ser Ile Pro Trp Thr Leu His Arg Val
 260 265 270
 Ile Ala Leu Leu Ile Phe Leu Ala Thr Ala Ala Ala Trp Ile Phe Ser
 275 280 285
 Ser Lys Ile Lys Thr Ala Phe Gly Ile Ser Asn Pro Asp Thr Val Ile
 290 295 300
 Ala Leu Ser Ala Ala Val Ala Val Val Val Phe Gly Val Ala Gln Trp
 305 310 315 320
 Lys Glu Val Ala Arg Asn Thr Asp Trp Gly Val Leu Met Leu Phe Gly

[illegible]

Glu Arg Asp Phe Asp Leu Thr Phe Ala Ala Ala Asp Ala Asp Phe Arg
 20 25 30
 Arg Tyr Phe Arg Ala Thr Phe Ser Asp Gly Ser Ser Val Val Cys Met
 35 40 45
 Asp Ala Pro Pro Asp Lys Met Ser Val Ala Pro Tyr Leu Lys Val Gln
 50 55 60
 Lys Leu Phe Asp Met Val Asn Val Pro Gln Val Leu His Ala Asp Thr
 65 70 75 80
 Asp Leu Gly Phe Val Val Leu Asn Asp Leu Gly Asn Thr Thr Phe Leu
 85 90 95
 Thr Ala Met Leu Gln Glu Gln Gly Glu Thr Ala His Lys Ala Leu Leu
 100 105 110
 Leu Glu Ala Ile Gly Glu Leu Val Glu Leu Gln Lys Ala Ser Arg Glu
 115 120 125
 Gly Val Leu Pro Glu Tyr Asp Arg Glu Thr Met Leu Arg Glu Ile Asn
 130 135 140
 Leu Phe Pro Glu Trp Phe Val Ala Lys Glu Leu Gly Arg Glu Leu Thr
 145 150 155 160
 Phe Lys Gln Arg Gln Leu Trp Gln Gln Thr Val Asp Thr Leu Leu Pro
 165 170 175
 Pro Leu Leu Ala Gln Pro Lys Val Tyr Val His Arg Asp Phe Ile Val
 180 185 190
 Arg Asn Leu Met Leu Thr Arg Gly Arg Pro Gly Val Leu Asp Phe Gln
 195 200 205
 Asp Ala Leu Tyr Gly Pro Ile Ser Tyr Asp Leu Val Ser Leu Leu Arg
 210 215 220
 Asp Ala Phe Ile Glu Trp Glu Glu Glu Phe Val Leu Asp Leu Val Ile
 225 230 235 240
 Arg Tyr Trp Glu Lys Ala Arg Ala Ala Gly Leu Pro Val Pro Glu Ala
 245 250 255
 Phe Asp Glu Phe Tyr Arg Trp Phe Glu Trp Met Gly Val Gln Arg His
 260 265 270
 Leu Lys Val Ala Gly Ile Phe Ala Arg Leu Tyr Tyr Arg Asp Gly Lys
 275 280 285
 Asp Lys Tyr Arg Pro Glu Ile Pro Arg Phe Leu Asn Tyr Leu Arg Arg
 290 295 300
 Val Ser Arg Arg Tyr Ala Glu Leu Ala Pro Leu Tyr Ala Leu Leu Val
 305 310 315 320
 Glu Leu Val Gly Asp Glu Glu Leu Glu Thr Gly Phe Thr Phe
 325 330

<210> 13
 <211> 1785
 <212> DNA
 <213> *Neisseria meningitidis* serogroup B NMB2050 DNA sequence

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 gaaaaggcgg caagatgtga ttttgtcgaa caggcacacg gcaaaaccgt gtcggaattg 180
 gcggtgttgg acgggaaata ccggcatttg caggacgaaa attatgcttt gggcaaccgt 240
 ttttccgcag ccgaaaagca gattgcccat ttgcaggaaa aagaggcgga gtcggcgcg 300
 ctgaagcagt cgtatatcga gttgcaggaa aaggcacagg gtttggcggt tgaaaacgaa 360
 cgtttgcaaa cgcagctcgg acaggaacgg aaggcgtttg ccgaccaata tgccttggaa 420
 cgccaaatcc gccaaagaat cgaaaccgat ttggaagaaa gccgccaaac tgtccgcgac 480
 gtgcaaaacg acctttccga tgtcggcaac cgttttgccg cagccgaaaa acagattgcc 540
 catttgacag aaaaagaggc ggaagcggag cggttgaggg agtcgcatac cgagttgcag 600
 gaaaaggcac agggtttggc ggttgaaaac gaacgtttgg caacgcaa at cgaacaggaa 660
 cgccttgctt ctgaagagaa gctgtccttg ctgggcgagg cgcgcaaaag tttgagcgat 720
 cagtttcaaa atcttgccaa cacgattttg gaagaaaaaa gccgcggttt taccgagcag 780
 aaccgcgagc agctccatca ggttttgaac ccgctaaacg aacgcattca cggtttcggc 840
 gagttggtca agcaaacta tgataaagaa tcgcgcgagc ggctgacgtt ggaaaacgaa 900
 ttgaaacggc ttcaggggtt gaacgcgcag ctgcacagcg aggcaaaagg cctgaccaac 960
 gcgctgaccg gtacgcagaa taaggttcag ggcaattggg gcgagatgat tctggaaacg 1020
 gttttgaaaa attccggcct tcagaaaggg cgggaatatg tggttcaggc ggcattccgtc 1080
 cgaaaagagg aagacggcgg cacgcgccgc ctccagcccg acgttttggg caacctgccc 1140
 gacaacaagc agattgtgat tgattccaag gtctcgctga cagcttatgt gcgctacacg 1200
 caggcggcgg atgcggatac ggcggcacgc gaactggcgg cacacgttgc cagcatccgt 1260
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 gatttcgtct ttatgtttat ccctgtcgaa ccggcctacc tgttggcggt gcagaatgac 1380
 gcgggcttgt tccaagagt tttcgacaaa cggattatgc tggtcggccc cagtacgctg 1440
 ctggcgactt tgaggacggt ggcgaatatt tggcgcaacg aacagcaaaa tcagaacgca 1500
 ctggcgattg cggacgaagg cggcaagctg tacgacaagt ttgtcggcgt cgtacagacg 1560
 ctcgaaagcg tcggcaaaagg catcgatcag gcgcaaagca gttttcagac ggcattcaag 1620
 caacttgccg aaggggcgcg gaatctggtc ggacgcgccg agaaaactgcg tctgttgggc 1680
 gtgaaggcag gcaacaact tcaacgggat ttggtcgagc gttccaatga aacaacggcg 1740
 ttgtcggaat ctttgaata cgcggcagaa gatgaagcag tctga 1785

<210> 14
 <211> 594
 <212> PRT
 <213> *Neisseria meningitidis* serogroup B NMB2050 protein sequence

<400> 14
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 Val Leu Phe Thr Trp Leu Leu Met Lys Gly Arg Phe Gln Gly Glu Phe
 20 25 30
 Ala Gly Leu Asn Ala His Leu Ala Glu Lys Ala Ala Arg Cys Asp Phe
 35 40 45
 Val Glu Gln Ala His Gly Lys Thr Val Ser Glu Leu Ala Val Leu Asp
 50 55 60
 Gly Lys Tyr Arg His Leu Gln Asp Glu Asn Tyr Ala Leu Gly Asn Arg
 65 70 75 80
 Phe Ser Ala Ala Glu Lys Gln Ile Ala His Leu Gln Glu Lys Glu Ala
 85 90 95

Glu Ser Ala Arg Leu Lys Gln Ser Tyr Ile Glu Leu Gln Glu Lys Ala
 100 105 110
 Gln Gly Leu Ala Val Glu Asn Glu Arg Leu Ala Thr Gln Leu Gly Gln
 115 120 125
 Glu Arg Lys Ala Phe Ala Asp Gln Tyr Ala Leu Glu Arg Gln Ile Arg
 130 135 140
 Gln Arg Ile Glu Thr Asp Leu Glu Glu Ser Arg Gln Thr Val Arg Asp
 145 150 155 160
 Val Gln Asn Asp Leu Ser Asp Val Gly Asn Arg Phe Ala Ala Ala Glu
 165 170 175
 Lys Gln Ile Ala His Leu Gln Glu Lys Glu Ala Glu Ala Glu Arg Leu
 180 185 190
 Arg Gln Ser His Thr Glu Leu Gln Glu Lys Ala Gln Gly Leu Ala Val
 195 200 205
 Glu Asn Glu Arg Leu Ala Thr Gln Ile Glu Gln Glu Arg Leu Ala Ser
 210 215 220
 Glu Glu Lys Leu Ser Leu Leu Gly Glu Ala Arg Lys Ser Leu Ser Asp
 225 230 235 240
 Gln Phe Gln Asn Leu Ala Asn Thr Ile Leu Glu Glu Lys Ser Arg Arg
 245 250 255
 Phe Thr Glu Gln Asn Arg Glu Gln Leu His Gln Val Leu Asn Pro Leu
 260 265 270
 Asn Glu Arg Ile His Gly Phe Gly Glu Leu Val Lys Gln Thr Tyr Asp
 275 280 285
 Lys Glu Ser Arg Glu Arg Leu Thr Leu Glu Asn Glu Leu Lys Arg Leu
 290 295 300
 Gln Gly Leu Asn Ala Gln Leu His Ser Glu Ala Lys Ala Leu Thr Asn
 305 310 315 320
 Ala Leu Thr Gly Thr Gln Asn Lys Val Gln Gly Asn Trp Gly Glu Met
 325 330 335
 Ile Leu Glu Thr Val Leu Glu Asn Ser Gly Leu Gln Lys Gly Arg Glu
 340 345 350
 Tyr Val Val Gln Ala Ala Ser Val Arg Lys Glu Glu Asp Gly Gly Thr
 355 360 365
 Arg Arg Leu Gln Pro Asp Val Leu Val Asn Leu Pro Asp Asn Lys Gln
 370 375 380
 Ile Val Ile Asp Ser Lys Val Ser Leu Thr Ala Tyr Val Arg Tyr Thr
 385 390 395 400
 Gln Ala Ala Asp Ala Asp Thr Ala Ala Arg Glu Leu Ala Ala His Val
 405 410 415
 Ala Ser Ile Arg Ala His Met Lys Gly Leu Ser Leu Lys Asp Tyr Thr

420	425	430
Asp Leu Glu Gly Val Asn Thr	Leu Asp Phe Val Phe Met Phe Ile Pro	
435	440	445
Val Glu Pro Ala Tyr Leu Leu Ala Leu Gln Asn Asp Ala Gly Leu Phe		
450	455	460
Gln Glu Cys Phe Asp Lys Arg Ile Met Leu Val Gly Pro Ser Thr Leu		
465	470	475
Leu Ala Thr Leu Arg Thr Val Ala Asn Ile Trp Arg Asn Glu Gln Gln		
485	490	495
Asn Gln Asn Ala Leu Ala Ile Ala Asp Glu Gly Gly Lys Leu Tyr Asp		
500	505	510
Lys Phe Val Gly Phe Val Gln Thr Leu Glu Ser Val Gly Lys Gly Ile		
515	520	525
Asp Gln Ala Gln Ser Ser Phe Gln Thr Ala Phe Lys Gln Leu Ala Glu		
530	535	540
Gly Arg Gly Asn Leu Val Gly Arg Ala Glu Lys Leu Arg Leu Leu Gly		
545	550	555
Val Lys Ala Gly Lys Gln Leu Gln Arg Asp Leu Val Glu Arg Ser Asn		
565	570	575
Glu Thr Thr Ala Leu Ser Glu Ser Leu Glu Tyr Ala Ala Glu Asp Glu		
580	585	590

Ala Val

<210> 15
 <211> 561
 <212> ---DNA
 <213> Neisseria meningitidis serogroup B NMB1335 DNA sequence

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gaagtgggaag gattcgacga tcccgcggtt caaggggttg cctgttatat ttcgtatgca	180
aaaaaaggcg gcttgaagga aatggtcaat ttggaagagg acgcgtccga cgcatacggtt	240
tcgtgcgttc agacggcatc ttcgatttct tttgacgaaa ccgcggtgcg caaaccgaaa	300
gaagtgtttca aacacgggtgc gagcttcgcg ttcaagagcc ggcagattgt ccgttattac	360
gaccccaaac gcaaaacctt cgcctatttg gtgtacagcg ataaaatcat ccaaggctcg	420
ccgaaaaatt ccttaagcgc ggtttcctgt ttcggcggcg gcataccgca aaccgatggg	480
gtgcaagccg atacttccgg caacctgctt gccggcgcct gcatgatttc caaccgata	540
gaaaatctcg acaaacgctg a	561

<210> 16
 <211> 186
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB1335 protein sequence

<400> 16	
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Gly Ser Gly Glu Thr Asp Lys Ile Gly Arg Ala Ser Thr Val Phe Asn
 20 25 30
 Ile Leu Gly Lys Asn Asp Arg Ile Glu Val Glu Gly Phe Asp Asp Pro
 35 40 45
 Asp Val Gln Gly Val Ala Cys Tyr Ile Ser Tyr Ala Lys Lys Gly Gly
 50 55 60
 Leu Lys Glu Met Val Asn Leu Glu Glu Asp Ala Ser Asp Ala Ser Val
 65 70 75 80
 Ser Cys Val Gln Thr Ala Ser Ser Ile Ser Phe Asp Glu Thr Ala Val
 85 90 95
 Arg Lys Pro Lys Glu Val Phe Lys His Gly Ala Ser Phe Ala Phe Lys
 100 105 110
 Ser Arg Gln Ile Val Arg Tyr Tyr Asp Pro Lys Arg Lys Thr Phe Ala
 115 120 125
 Tyr Leu Val Tyr Ser Asp Lys Ile Ile Gln Gly Ser Pro Lys Asn Ser
 130 135 140
 Leu Ser Ala Val Ser Cys Phe Gly Gly Gly Ile Pro Gln Thr Asp Gly
 145 150 155 160
 Val Gln Ala Asp Thr Ser Gly Asn Leu Leu Ala Gly Ala Cys Met Ile
 165 170 175
 Ser Asn Pro Ile Glu Asn Leu Asp Lys Arg
 180 185

<210> 17
 <211> 693
 <212> DNA
 <213> *Neisseria meningitidis* serogroup B NMB2035 DNA sequence

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 cgtgccaaaga aaaacctgat tatccgcccc gccggcacac ataccgtccg catcagcgtc 120
 ccaccctgct tctccgtctc cgctctaaac cgctggctgt atgaaaacga agccgtcctg 180
 cggcaaacac tggcgaaaac accgcccgcg caaactgccg aaaaccggct gcccgaaatcc 240
 atcctcttcc acggcagaca gcttgccctc accgcccac aagacacgca aatcctgctg 300
 atgccgtctg aaatccgtgt tcccgaaggc gcacccgaaa aacagcttgc gctgctgcgg 360
 gacttttttg aacggcaggc gcacagttac ctgattcccc gcctcgaacg ccacgcccgc 420
 accacacaac tgttccccgc ctctcctcgt ctgacctctg ccaaaacctt ctggggcgtg 480
 tgccgcaaaa ccacaggcat acgcttcaac tggcggctgg tcggcgccacc ggaatacgtt 540
 gccgactatg tctgcataca cgaactctgc cacctcgccc atcccgacca cagccccgcc 600
 ttttggaac tgaccgcgcg ctctcgcccc tacacgccc aagcgaaaca gtggctcaaa 660
 atccacggca gggaactttt cgccttaggc tga 693

<210> 18
 <211> 230
 <212> PRT
 <213> *Neisseria meningitidis* serogroup B NMB2035 protein sequence

<400> 18
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Glu Ile Lys Arg Arg Ala Lys Lys Asn Leu Ile Ile Arg Pro Ala Gly
 20 25 30
 Thr His Thr Val Arg Ile Ser Val Pro Pro Cys Phe Ser Val Ser Ala
 35 40 45
 Leu Asn Arg Trp Leu Tyr Glu Asn Glu Ala Val Leu Arg Gln Thr Leu
 50 55 60
 Ala Lys Thr Pro Pro Pro Gln Thr Ala Glu Asn Arg Leu Pro Glu Ser
 65 70 75 80
 Ile Leu Phe His Gly Arg Gln Leu Ala Leu Thr Ala His Gln Asp Thr
 85 90 95
 Gln Ile Leu Leu Met Pro Ser Glu Ile Arg Val Pro Glu Gly Ala Pro
 100 105 110
 Glu Lys Gln Leu Ala Leu Leu Arg Asp Phe Leu Glu Arg Gln Ala His
 115 120 125
 Ser Tyr Leu Ile Pro Arg Leu Glu Arg His Ala Arg Thr Thr Gln Leu
 130 135 140
 Phe Pro Ala Ser Ser Ser Leu Thr Ser Ala Lys Thr Phe Trp Gly Val
 145 150 155 160
 Cys Arg Lys Thr Thr Gly Ile Arg Phe Asn Trp Arg Leu Val Gly Ala
 165 170 175
 Pro Glu Tyr Val Ala Asp Tyr Val Cys Ile His Glu Leu Cys His Leu
 180 185 190
 Ala His Pro Asp His Ser Pro Ala Phe Trp Glu Leu Thr Arg Arg Phe
 195 200 205
 Ala Pro Tyr Thr Pro Lys Ala Lys Gln Trp Leu Lys Ile His Gly Arg
 210 215 220

Glu Leu Phe Ala Leu Gly
 225 230

<210> 19

<211> 1257

<212> DNA

<213> Neisseria meningitidis serogroup B NMB1351 DNA sequence

<400> 19

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gategccacg	aaatcgccga	aaccgccttt	gccgcgctgc	gccactatca	aaaaatcagt	180
accgccctac	gccgtccgca	cgcgagcccg	cgcaaagccg	ctctcgccgc	actggttctc	240
ggcagaagca	ccaacatcag	ccaaatcaaa	gacctgcttg	atgaagaaga	aacagcgttc	300
ctcggcaatt	tgaagcccg	taaaaccgag	ttttcagaca	gctgaatac	cgccgcagaa	360
ttgccgcaat	ggctggtgga	acaactgaaa	cagcattggc	gcgaagaaga	aatcctcgct	420
ttcgggccga	gcatcaacca	gcctgccccg	ctcgacatcc	gcgtcaacac	tttgaaaggc	480
aaacgcgata	aagtgtgtgc	gctgttgcaa	gccgaaagtg	ccgatgcaga	ggcaacgcct	540
tattgcgctt	ggggcatccg	cctgaaaaac	aaaatcgcg	ttaacaaaca	cgaactgttt	600
ttagacggca	caactggaagt	ccaagacgaa	ggcagccagc	tgcttgccct	attggtgggc	660
gcaaaacgag	gcgaaatcat	tgctgatttc	tgtgcccgtg	ccggcggtta	aaccttggct	720
gtcgggtgcgc	aaatggcgaa	caaaggcaga	atctacgcct	tcgatatcgc	cgaaaaacgc	780

cttgccaacc	tcaaaccgcg	tatgaccgcg	gccggactga	ccaatatcca	ccccgaacgc	840
atcggcagcg	aacacgatgc	cgtatcgcc	cgactggcag	gcaaagccga	ccgtgtgttg	900
gtggacgcgc	cctgctccgg	tttgggcact	ttacgccgca	atcccgacct	caaataccgc	960
caatccgccg	aaaccgtcgc	caaccttttg	gaacagcaac	acagcatcct	cgatgccgcc	1020
tccaaactgg	taaaaccgca	aggacgtttg	gtgtacgcc	cttgcagcat	cctgcccga	1080
gaaaacgagc	tgcaagtcga	acgtttcctg	tccgaacatc	ccgaatttga	acccgtcaac	1140
tgccgccgaac	tgcttgccgg	tttgaaaatc	gatttggata	ccggcaaata	cctgcgcctc	1200
aactccgccc	gacaccaaac	cgacggcttc	ttcgccgccg	tattgcaacg	caaataa	1257

<210> 20

<211> 418

<212> PRT

<213> Neisseria meningitidis serogroup B NMB1351 protein sequence

<400> 20

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Leu	Thr	Phe	Lys	Gln	Pro	Ala	Asp	Ala	Val	Leu	Ser	Ala	Tyr	Phe	Arg
			20					25					30		

Glu	His	Lys	Lys	Leu	Gly	Ser	Gln	Asp	Arg	His	Glu	Ile	Ala	Glu	Thr
		35					40					45			

Ala	Phe	Ala	Ala	Leu	Arg	His	Tyr	Gln	Lys	Ile	Ser	Thr	Ala	Leu	Arg
	50					55					60				

Arg	Pro	His	Ala	Gln	Pro	Arg	Lys	Ala	Ala	Leu	Ala	Ala	Leu	Val	Leu
65					70					75					80

Gly	Arg	Ser	Thr	Asn	Ile	Ser	Gln	Ile	Lys	Asp	Leu	Leu	Asp	Glu	Glu
				85					90					95	

Glu	Thr	Ala	Phe	Leu	Gly	Asn	Leu	Lys	Ala	Arg	Lys	Thr	Glu	Phe	Ser
		100						105					110		

Asp	Ser	Leu	Asn	Thr	Ala	Ala	Glu	Leu	Pro	Gln	Trp	Leu	Val	Glu	Gln
		115					120					125			

Leu	Lys	Gln	His	Trp	Arg	Glu	Glu	Glu	Ile	Leu	Ala	Phe	Gly	Arg	Ser
	130					135					140				

Ile	Asn	Gln	Pro	Ala	Pro	Leu	Asp	Ile	Arg	Val	Asn	Thr	Leu	Lys	Gly
145				150						155					160

Lys	Arg	Asp	Lys	Val	Leu	Pro	Leu	Leu	Gln	Ala	Glu	Ser	Ala	Asp	Ala
			165						170					175	

Glu	Ala	Thr	Pro	Tyr	Ser	Pro	Trp	Gly	Ile	Arg	Leu	Lys	Asn	Lys	Ile
		180						185					190		

Ala	Leu	Asn	Lys	His	Glu	Leu	Phe	Leu	Asp	Gly	Thr	Leu	Glu	Val	Gln
		195					200					205			

Asp	Glu	Gly	Ser	Gln	Leu	Leu	Ala	Leu	Leu	Val	Gly	Ala	Lys	Arg	Gly
	210				215						220				

Glu	Ile	Ile	Val	Asp	Phe	Cys	Ala	Gly	Ala	Gly	Gly	Lys	Thr	Leu	Ala
225				230						235					240

Val	Gly	Ala	Gln	Met	Ala	Asn	Lys	Gly	Arg	Ile	Tyr	Ala	Phe	Asp	Ile
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

245	250	255
Ala Glu Lys Arg Leu Ala Asn Leu Lys Pro Arg Met Thr Arg Ala Gly		
260	265	270
Leu Thr Asn Ile His Pro Glu Arg Ile Gly Ser Glu His Asp Ala Arg		
275	280	285
Ile Ala Arg Leu Ala Gly Lys Ala Asp Arg Val Leu Val Asp Ala Pro		
290	295	300
Cys Ser Gly Leu Gly Thr Leu Arg Arg Asn Pro Asp Leu Lys Tyr Arg		
305	310	315
Gln Ser Ala Glu Thr Val Ala Asn Leu Leu Glu Gln Gln His Ser Ile		
325	330	335
Leu Asp Ala Ala Ser Lys Leu Val Lys Pro Gln Gly Arg Leu Val Tyr		
340	345	350
Ala Thr Cys Ser Ile Leu Pro Glu Glu Asn Glu Leu Gln Val Glu Arg		
355	360	365
Phe Leu Ser Glu His Pro Glu Phe Glu Pro Val Asn Cys Ala Glu Leu		
370	375	380
Leu Ala Gly Leu Lys Ile Asp Leu Asp Thr Gly Lys Tyr Leu Arg Leu		
385	390	395
Asn Ser Ala Arg His Gln Thr Asp Gly Phe Phe Ala Ala Val Leu Gln		
405	410	415

Arg Lys

<210> 21
 <211> 1014
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB1574 DNA sequence

<400> 21						
atgcaagtct	attacgataa	agatgccgat	ctgtccctaa	tcaaaggcaa	aaccggttgcc	60
atcatcggtt	acggttcgca	aggatcatgcc	catgccgccca	acctgaaaga	ttcgggtgta	120
aacgtggtga	ttggtctgcg	ccaaggttct	tcttggaana	aagccgaagc	agccggtcat	180
gtcgtcaaaa	ccgttgctga	agcgaccaaa	gaagccgatg	tcgttatgct	gctgctgcct	240
gacgaaacca	tgcttgccgt	ctatcacgcc	gaagttacag	ccaatttgaa	agaaggcgca	300
acgctggcat	ttgcacacgg	cttcaacgtg	cactacaacc	aaatcgttcc	gcgtgccgac	360
ttggacgtga	ttatggttgc	ccccaaaggt	ccggggccata	ccgtacgcag	tgaatacaaa	420
cgcggcgcg	gcgtgccttc	tctgattgcc	gtttaccaag	acaattccgg	caaagccaaa	480
gacatcgccc	tgtcttatgc	ggctgccaac	ggcggcacca	aaggcggtgt	gattgaaacc	540
actttccgcg	aagaaaccga	aaccgatctg	ttcggcgaa	aagccgtatt	gtgcggcggc	600
gtgggtcgagt	tgatcaaggc	gggttttgaa	acctgaccg	aagccggtta	cgcgccctgaa	660
atggcttact	tcgaatgtct	gcacgaaatg	aaactgatcg	ttgacctgat	tttcgaaggc	720
ggtattgcca	atatgaacta	ctccatttcc	aacaatgcgg	agtacggcga	atacgttacc	780
ggccctgaag	tggtcaatgc	ttccagcaaa	gaagccatgc	gcaatgccct	gaaacgcatt	840
caaaccggcg	aatacgcaaa	aatgtttatc	caagagggtg	atgtcaacta	tgcggtctatg	900
actgcccgcg	gccgtctgaa	tgccgaccac	caagttgaaa	aagtcggcgc	acaactgcgt	960
gccatgatgc	cttggtattac	tgccaacaaa	ttggttgacc	aagacaaaaa	ctga	1014

<210> 22
 <211> 337

<212> PRT
 <213> Neisseria meningitidis serogroup B NMB1574 protein sequence

<400> 22
 Met Gln Val Tyr Tyr Asp Lys Asp Ala Asp Leu Ser Leu Ile Lys Gly
 1 5 10 15
 Lys Thr Val Ala Ile Ile Gly Tyr Gly Ser Gln Gly His Ala His Ala
 20 25 30
 Ala Asn Leu Lys Asp Ser Gly Val Asn Val Val Ile Gly Leu Arg Gln
 35 40 45
 Gly Ser Ser Trp Lys Lys Ala Glu Ala Ala Gly His Val Val Lys Thr
 50 55 60
 Val Ala Glu Ala Thr Lys Glu Ala Asp Val Val Met Leu Leu Leu Pro
 65 70 75 80
 Asp Glu Thr Met Pro Ala Val Tyr His Ala Glu Val Thr Ala Asn Leu
 85 90 95
 Lys Glu Gly Ala Thr Leu Ala Phe Ala His Gly Phe Asn Val His Tyr
 100 105 110
 Asn Gln Ile Val Pro Arg Ala Asp Leu Asp Val Ile Met Val Ala Pro
 115 120 125
 Lys Gly Pro Gly His Thr Val Arg Ser Glu Tyr Lys Arg Gly Gly Gly
 130 135 140
 Val Pro Ser Leu Ile Ala Val Tyr Gln Asp Asn Ser Gly Lys Ala Lys
 145 150 155 160
 Asp Ile Ala Leu Ser Tyr Ala Ala Ala Asn Gly Gly Thr Lys Gly Gly
 165 170 175
 Val Ile Glu Thr Thr Phe Arg Glu Glu Thr Glu Thr Asp Leu Phe Gly
 180 185 190
 Glu Gln Ala Val Leu Cys Gly Gly Val Val Glu Leu Ile Lys Ala Gly
 195 200 205
 Phe Glu Thr Leu Thr Glu Ala Gly Tyr Ala Pro Glu Met Ala Tyr Phe
 210 215 220
 Glu Cys Leu His Glu Met Lys Leu Ile Val Asp Leu Ile Phe Glu Gly
 225 230 235 240
 Gly Ile Ala Asn Met Asn Tyr Ser Ile Ser Asn Asn Ala Glu Tyr Gly
 245 250 255
 Glu Tyr Val Thr Gly Pro Glu Val Val Asn Ala Ser Ser Lys Glu Ala
 260 265 270
 Met Arg Asn Ala Leu Lys Arg Ile Gln Thr Gly Glu Tyr Ala Lys Met
 275 280 285
 Phe Ile Gln Glu Gly Asn Val Asn Tyr Ala Ser Met Thr Ala Arg Arg
 290 295 300

Arg Leu Asn Ala Asp His Gln Val Glu Lys Val Gly Ala Gln Leu Arg
305 310 315 320

Ala Met Met Pro Trp Ile Thr Ala Asn Lys Leu Val Asp Gln Asp Lys
325 330 335

Asn

<210> 23
<211> 693
<212> DNA
<213> Neisseria meningitidis serogroup B NMB1298 DNA sequence

<400> 23
atgaaactta tcaaatacct gcaatatcaa ggcataggaa gccgcaagca gtgccaatgg 60
ctgattgccg gcggttatgt tttcatcaac ggaacctgca tggacgacac cgatgcagac 120
atcgattcct catccgtcga aacgttggat attgacgggg aagcagtaac cgtcgttccc 180
gaaccctatt tctacatcat gctcaacaag cctgaagatt acgaaacttc gcacaaaccc 240
aagcactacc gcagcgtatt cagcctgttc cccgacaata tgcggaacat cgatatgcag 300
gcggtcggca ggctggatgc agatacgacc ggcgatttgc tgattaccaa cgacggcaaa 360
ctgaaccaca gcctgacttc gccgagcaga aaaattccca agctgtacga agtaacgctc 420
aaacacccca caggagaaac gctctgcgaa accttgaaaa acggcggtgct gctccacgac 480
gaaaacgaaa ccgtttgtgc cgccgatgcc gttttgaaaa acccgaccac cctgctgctg 540
accattaccg aaggaaaata ccaccaagtc aaacgcgatga tcgccgccgc cggcaaccgc 600
gtgcaacacc ttcatcgccg gcgattcgca catctggaaa cagaaaacct caaacccggg 660
gaatggaaat ttatcgaatg tccaaaattc tga 693

<210> 24
<211> 230
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1298 protein sequence

<400> 24
Met Lys Leu Ile Lys Tyr Leu Gln Tyr Gln Gly Ile Gly Ser Arg Lys
1 5 10 15

Gln Cys Gln Trp Leu Ile Ala Gly Gly Tyr Val Phe Ile Asn Gly Thr
20 25 30

Cys Met Asp Asp Thr Asp Ala Asp Ile Asp Ser Ser Ser Val Glu Thr
35 40 45

Leu Asp Ile Asp Gly Glu Ala Val Thr Val Val Pro Glu Pro Tyr Phe
50 55 60

Tyr Ile Met Leu Asn Lys Pro Glu Asp Tyr Glu Thr Ser His Lys Pro
65 70 75 80

Lys His Tyr Arg Ser Val Phe Ser Leu Phe Pro Asp Asn Met Arg Asn
85 90 95

Ile Asp Met Gln Ala Val Gly Arg Leu Asp Ala Asp Thr Thr Gly Val
100 105 110

Leu Leu Ile Thr Asn Asp Gly Lys Leu Asn His Ser Leu Thr Ser Pro
115 120 125

Ser Arg Lys Ile Pro Lys Leu Tyr Glu Val Thr Leu Lys His Pro Thr
130 135 140

Gly Glu Thr Leu Cys Glu Thr Leu Lys Asn Gly Val Leu Leu His Asp
145 150 155 160

Glu Asn Glu Thr Val Cys Ala Ala Asp Ala Val Leu Lys Asn Pro Thr
165 170 175

Thr Leu Leu Leu Thr Ile Thr Glu Gly Lys Tyr His Gln Val Lys Arg
180 185 190

Met Ile Ala Ala Ala Gly Asn Arg Val Gln His Leu His Arg Arg Arg
195 200 205

Phe Ala His Leu Glu Thr Glu Asn Leu Lys Pro Gly Glu Trp Lys Phe
210 215 220

Ile Glu Cys Pro Lys Phe
225 230

<210> 25

<211> 900

<212> DNA

<213> Neisseria meningitidis serogroup B NMB1856 DNA sequence

<400> 25

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agcgtgctgg	cggagcagtt	ggcgatggca	aattctgccc	taagccgcat	cgtcaaacgg	120
ctggaggaaa	agttgggtgt	gaacctgctc	aaccgcacca	cgcggaact	cagtctgacg	180
gaagaaggcg	cgcaatattt	ccgcgcgcgc	cagagaatcc	tgcaagaaat	ggcagcggcg	240
gaaaccgaaa	tgctggcagt	gcacgaaata	ccgcaaggcg	tggtgagcgt	ggattccgcg	300
atgccgatgg	tgctgcatct	gctggcgccg	ctggcagcaa	aattcaacga	acgctatccg	360
catatccgac	tttcgctcgt	ttcttccgaa	ggctatatca	atctgattga	acgcaaagtc	420
gatattgcct	tacgggcccgc	agaattggac	gattccgggc	tgcggtgcacg	ccatctgttt	480
gacagccgct	tccgcgtaat	cgccagtcct	gaatacctgg	caaaacacgg	cacgccgcaa	540
tctacagaag	agcttgccgc	ccaccaatgt	ttaggcttca	ccgaacccgc	ttctctaaat	600
acatgggccc	ttttagatgc	gcagggaat	ccctataaga	tttcaccgca	ctttaccgcc	660
agcagcgggtg	aaatcttacg	ctcgttgtgc	ctttcagggt	gcggtattgt	ttgcttatca	720
gattttttgg	ttgacaacga	catcgctgaa	ggaaagttaa	ttcccctgct	cgccgaacaa	780
acctccgata	aaacacaccc	ctttaatgct	gtttattaca	gcgataaagc	cgtcaatctc	840
cgcttacgcg	tattttttgga	tttttttagtg	gaggaactgg	gaaacaatct	ctgtggataa	900

<210> 26

<211> 299

<212> PRT

<213> Neisseria meningitidis serogroup B NMB1856 protein sequence

<400> 26

Met Lys Thr Asn Ser Glu Glu Leu Thr Val Phe Val Gln Val Val Glu
1 5 10 15

Ser Gly Ser Phe Ser Arg Ala Ala Glu Gln Leu Ala Met Ala Asn Ser
20 25 30

Ala Val Ser Arg Ile Val Lys Arg Leu Glu Glu Lys Leu Gly Val Asn
35 40 45

Leu Leu Asn Arg Thr Thr Arg Gln Leu Ser Leu Thr Glu Glu Gly Ala
50 55 60

Gln Tyr Phe Arg Arg Ala Gln Arg Ile Leu Gln Glu Met Ala Ala Ala
65 70 75 80

Glu Thr Glu Met Leu Ala Val His Glu Ile Pro Gln Gly Val Leu Ser
 85 90 95
 Val Asp Ser Ala Met Pro Met Val Leu His Leu Leu Ala Pro Leu Ala
 100 105 110
 Ala Lys Phe Asn Glu Arg Tyr Pro His Ile Arg Leu Ser Leu Val Ser
 115 120 125
 Ser Glu Gly Tyr Ile Asn Leu Ile Glu Arg Lys Val Asp Ile Ala Leu
 130 135 140
 Arg Ala Gly Glu Leu Asp Asp Ser Gly Leu Arg Ala Arg His Leu Phe
 145 150 155 160
 Asp Ser Arg Phe Arg Val Ile Ala Ser Pro Glu Tyr Leu Ala Lys His
 165 170 175
 Gly Thr Pro Gln Ser Thr Glu Glu Leu Ala Gly His Gln Cys Leu Gly
 180 185 190
 Phe Thr Glu Pro Gly Ser Leu Asn Thr Trp Ala Val Leu Asp Ala Gln
 195 200 205
 Gly Asn Pro Tyr Lys Ile Ser Pro His Phe Thr Ala Ser Ser Gly Glu
 210 215 220
 Ile Leu Arg Ser Leu Cys Leu Ser Gly Cys Gly Ile Val Cys Leu Ser
 225 230 235 240
 Asp Phe Leu Val Asp Asn Asp Ile Ala Glu Gly Lys Leu Ile Pro Leu
 245 250 255
 Leu Ala Glu Gln Thr Ser Asp Lys Thr His Pro Phe Asn Ala Val Tyr
 260 265 270
 Tyr Ser Asp Lys Ala Val Asn Leu Arg Leu Arg Val Phe Leu Asp Phe
 275 280 285
 Leu Val Glu Glu Leu Gly Asn Asn Leu Cys Gly
 290 295

<210> 27

<211> 696

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0119 DNA sequence

<400> 27

atgatgaagg	atttgaattt	gagcaacagc	ctgttcaaag	gctacaacga	caaacatggc	60
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ggtgaataca	aactccctga	aaacaaaatc	gaccatacat	ttgcaaacaa	atccctctat	180
ttcggagagc	aggcaaaaaa	gtggcggttac	gacaatacga	taaaaaattg	gtttgaaatg	240
tggggacacc	ccttagacga	aaatggattg	ggcggtgcat	ttgaaaaatc	cctgggttcaa	300
accaactggg	ctgctacaca	gggcaacact	atcgacaatc	ccgacaagtt	cacacaaccc	360
gagcacatcg	ataattttct	ctaccacatc	gaaaaactgc	gtccgaaagt	catacctcttc	420
atgggcagca	ggttggcgga	ttttctgaac	aacaaaaatg	tactgccacg	cttcgagcag	480
ttggtcggta	agcagaccaa	accgctggag	acggtgcaaa	aagaatttga	cggtacacgt	540
ttcaatgtca	aattccaatc	gtttgaagat	tgcgagtgcg	tctgctttcc	ccatcccagt	600
gccagtcgcg	gtctatctta	cgattacatc	gccttgtttg	cgctgaaat	gaaccggatt	660
ttatcggact	ttaaaacaac	acgcggattc	aaataa			696

<210> 28
 <211> 231
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0119 protein sequence

<400> 28
 Met Met Lys Asp Leu Asn Leu Ser Asn Ser Leu Phe Lys Gly Tyr Asn
 1 5 10 15
 Asp Lys His Gly Leu Met Ile Cys Gly Tyr Glu Trp Gly Trp Ser Lys
 20 25 30
 Ala Asp Glu Ala Ala Tyr Val Ala Gly Glu Tyr Lys Leu Pro Glu Asn
 35 40 45
 Lys Ile Asp His Thr Phe Ala Asn Lys Ser Leu Tyr Phe Gly Glu Gln
 50 55 60
 Ala Lys Lys Trp Arg Tyr Asp Asn Thr Ile Lys Asn Trp Phe Glu Met
 65 70 75 80
 Trp Gly His Pro Leu Asp Glu Asn Gly Leu Gly Gly Ala Phe Glu Lys
 85 90 95
 Ser Leu Val Gln Thr Asn Trp Ala Ala Thr Gln Gly Asn Thr Ile Asp
 100 105 110
 Asn Pro Asp Lys Phe Thr Gln Pro Glu His Ile Asp Asn Phe Leu Tyr
 115 120 125
 His Ile Glu Lys Leu Arg Pro Lys Val Ile Leu Phe Met Gly Ser Arg
 130 135 140
 Leu Ala Asp Phe Leu Asn Asn Gln Asn Val Leu Pro Arg Phe Glu Gln
 145 150 155 160
 Leu Val Gly Lys Gln Thr Lys Pro Leu Glu Thr Val Gln Lys Glu Phe
 165 170 175
 Asp Gly Thr Arg Phe Asn Val Lys Phe Gln Ser Phe Glu Asp Cys Glu
 180 185 190
 Val Val Cys Phe Pro His Pro Ser Ala Ser Arg Gly Leu Ser Tyr Asp
 195 200 205
 Tyr Ile Ala Leu Phe Ala Pro Glu Met Asn Arg Ile Leu Ser Asp Phe
 210 215 220
 Lys Thr Thr Arg Gly Phe Lys
 225 230

<210> 29
 <211> 1065
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB1705 DNA sequence

<400> 29
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 caatatgtct atgatgtttc aaaagcattg gggcttcggg gctgcacaat gttaccgcc 120
 gtcaataaaa ataatgaatt gatgcacagg cgattttccg aagtttcttc cgttttcaca 180
 acgcgccttc acacgctcaa cgggctgttt tcgctctacg cacttaccgc ctttatccgg 240


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aaaaaccgca tttcccacct gatgatacac accggcaaaa ttgccgcctt atccatactt 300
ttgaaaaaac tgaccggggt ggcctgata tttgtcaaac ataatgtcgt cgccaacaaa 360
accgattttt accaccgcct gatacagaaa aacacagacc gctttatttg cgtttcccgt 420
ctggtttacg atgtgcaaac cgccgacaat ccctttaaag aaaaataaccg gattgttcat 480
aacggtatcg ataccggccg tttccctccc tctcaagaaa aacccgacag ccgttttttt 540
accgtcgctt acgcccggcg gatcagtcga gaaaaaggat tggaaaacct gattgaagcc 600
tgtgtgatac tgcacgcgaa atatacctcaa atcaggctca aattggcagg ggacggacat 660
ccggattata tgtgccgcct gaagcgggac gtatctgctt caggagcaga accatttggt 720
tcttttgaag ggtttaccga aaaacttgct tctgtttacc gccaaagcga tgtcgtggtt 780
ttgccagcc tcgtcccga ggcattcggg ttgtcattat gcgaggcgat gtactgccga 840
acggcgggtga tttccaatac tttgggggcg caaaaggaaa ttgtcgaaca tcatcaatcg 900
gggattctgc tggacaggct gacacctgaa tctttggcgg acgaaatcga acgcctcgtc 960
ttgaaccctg aaacgaaaaa cgactggca acggcagctc atcaatgcgt cgccgccgct 1020
tttaccatca accataccgc cgacaaatta ttggatgcaa tataa 1065

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<210> 30
 <211> 354
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB1705 protein sequence

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<400> 30
Met Glu Lys Glu Phe Arg Ile Leu Asn Ile Val Ser Ala Lys Ile Trp
1 5 10 15

Gly Gly Gly Glu Gln Tyr Val Tyr Asp Val Ser Lys Ala Leu Gly Leu
20 25 30

Arg Gly Cys Thr Met Phe Thr Ala Val Asn Lys Asn Asn Glu Leu Met
35 40 45

His Arg Arg Phe Ser Glu Val Ser Ser Val Phe Thr Thr Arg Leu His
50 55 60

Thr Leu Asn Gly Leu Phe Ser Leu Tyr Ala Leu Thr Arg Phe Ile Arg
65 70 75 80

Lys Asn Arg Ile Ser His Leu Met Ile His Thr Gly Lys Ile Ala Ala
85 90 95

Leu Ser Ile Leu Leu Lys Lys Leu Thr Gly Val Arg Leu Ile Phe Val
100 105 110

Lys His Asn Val Val Ala Asn Lys Thr Asp Phe Tyr His Arg Leu Ile
115 120 125

Gln Lys Asn Thr Asp Arg Phe Ile Cys Val Ser Arg Leu Val Tyr Asp
130 135 140

Val Gln Thr Ala Asp Asn Pro Phe Lys Glu Lys Tyr Arg Ile Val His
145 150 155 160

Asn Gly Ile Asp Thr Gly Arg Phe Pro Pro Ser Gln Glu Lys Pro Asp
165 170 175

Ser Arg Phe Phe Thr Val Ala Tyr Ala Gly Arg Ile Ser Pro Glu Lys
180 185 190

Gly Leu Glu Asn Leu Ile Glu Ala Cys Val Ile Leu His Arg Lys Tyr
195 200 205

Pro Gln Ile Arg Leu Lys Leu Ala Gly Asp Gly His Pro Asp Tyr Met

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210 215 220

Cys Arg Leu Lys Arg Asp Val Ser Ala Ser Gly Ala Glu Pro Phe Val
 225 230 235 240

Ser Phe Glu Gly Phe Thr Glu Lys Leu Ala Ser Phe Tyr Arg Gln Ser
 245 250 255

Asp Val Val Val Leu Pro Ser Leu Val Pro Glu Ala Phe Gly Leu Ser
 260 265 270

Leu Cys Glu Ala Met Tyr Cys Arg Thr Ala Val Ile Ser Asn Thr Leu
 275 280 285

Gly Ala Gln Lys Glu Ile Val Glu His His Gln Ser Gly Ile Leu Leu
 290 295 300

Asp Arg Leu Thr Pro Glu Ser Leu Ala Asp Glu Ile Glu Arg Leu Val
 305 310 315 320

Leu Asn Pro Glu Thr Lys Asn Ala Leu Ala Thr Ala Ala His Gln Cys
 325 330 335

Val Ala Ala Arg Phe Thr Ile Asn His Thr Ala Asp Lys Leu Leu Asp
 340 345 350

Ala Ile

<210> 31
 <211> 1272
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB2065 DNA sequence

<400> 31

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ggtttgaccg	ttttgatttt	ggggtcgata	tttgcttctt	tgatatacag	gtattgtgcg	180
gtctatgcga	attatgtttg	gttggcggcc	attgttttgc	tggtgctggt	gaagaagggtc	240
gtgcctgtcc	atgcggcact	ttggggcttg	gcgttggttg	ctttcagtgt	gaaagccgta	300
tacgtcgatg	aagcagggaa	tacatcggat	attgtgcgct	acggtgcagg	attttatttg	360
tggtatgccg	catttgcggt	tgccaccatc	ggtacgtttg	ccggaaagaa	taaggaaaga	420
aaagccgcat	cagcggcaga	cgggataaaa	atgacgtttg	ataaatggtt	gggcttgtca	480
aaactgccta	aaaatgaagc	aagaatgctg	ctacaatatg	tttcggaata	tacgcgcgtg	540
cagttgttga	cgcggggcgg	ggaagaaatg	ccggacgaag	tccgacagcg	ggcggacagg	600
ctggcgcaac	gcgctctgaa	cggcgagccg	gttgccctata	ttttaggtgt	gcgcgaattt	660
tatggcagac	gctttacagt	caatccgagc	gtgctgattc	cgcgccccga	aaccgaacat	720
ttggtcgaag	ccgtattggc	gcgcctgccc	gaaaacgggc	gcgtgtggga	tttggggacg	780
ggcagcggcg	cgttgccgtg	aaccgtcgcg	ctcgaacgcc	ccgatgcgtt	tgtgcgcgca	840
tccgacatca	gcccgcccgc	ccttgaaaacg	gcgcggaaaa	atgcggcgga	tttgggcgcg	900
cgggtcgaat	ttgcacacgg	ttcgtggttc	gacaccgata	tgccgtctga	agggaaatgg	960
gacatcatcg	tgtccaaccc	gccctatatc	gaaaacggcg	ataaacattt	gttgcaaggc	1020
gatttgcggt	ttgagccgca	aatcgcgctg	accgactttt	cagacggcct	aagctgcac	1080
cgcaccttgg	cgcaaggcgc	gcccgaaccgt	ttggcggaag	gcggtttttt	attgctggaa	1140
cacggtttcg	atcagggcgc	ggcgggtgcgc	ggcgtgttgg	cggagaatgg	tttttcagga	1200
gtggaaaccc	tgccggattt	ggcgggtttg	gacagggtta	cgctggggaa	gtatatgaag	1260
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<210> 32
 <211> 423
 <212> PRT

<213> Neisseria meningitidis serogroup B NMB2065 protein sequence

<400> 32

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1 5 10 15

Val Ser Val Ala Leu Trp Ile Ala Ser Leu Ser Asn Val Ala Phe Tyr
20 25 30

Leu Gly Asn His Gly Ser Met Glu Gly Leu Thr Val Leu Ile Leu Gly
35 40 45

Ser Ile Phe Ala Ser Leu Asp Ile Arg Tyr Cys Ala Val Tyr Ala Asn
50 55 60

Tyr Val Trp Leu Ala Ala Ile Val Leu Leu Ala Leu Arg Lys Lys Val
65 70 75 80

Val Pro Val His Ala Ala Leu Trp Gly Leu Ala Leu Val Ala Phe Ser
85 90 95

Val Lys Ala Val Tyr Val Asp Glu Ala Gly Asn Thr Ser Asp Ile Val
100 105 110

Arg Tyr Gly Ala Gly Phe Tyr Leu Trp Tyr Ala Ala Phe Ala Val Ala
115 120 125

Thr Ile Gly Thr Phe Ala Gly Lys Asn Lys Glu Arg Lys Ala Ala Ser
130 135 140

Ala Ala Asp Gly Ile Lys Met Thr Phe Asp Lys Trp Leu Gly Leu Ser
145 150 155 160

Lys Leu Pro Lys Asn Glu Ala Arg Met Leu Leu Gln Tyr Val Ser Glu
165 170 175

Tyr Thr Arg Val Gln Leu Leu Thr Arg Gly Gly Glu Glu Met Pro Asp
180 185 190

Glu Val Arg Gln Arg Ala Asp Arg Leu Ala Gln Arg Arg Leu Asn Gly
195 200 205

Glu Pro Val Ala Tyr Ile Leu Gly Val Arg Glu Phe Tyr Gly Arg Arg
210 215 220

Phe Thr Val Asn Pro Ser Val Leu Ile Pro Arg Pro Glu Thr Glu His
225 230 235 240

Leu Val Glu Ala Val Leu Ala Arg Leu Pro Glu Asn Gly Arg Val Trp
245 250 255

Asp Leu Gly Thr Gly Ser Gly Ala Val Ala Val Thr Val Ala Leu Glu
260 265 270

Arg Pro Asp Ala Phe Val Arg Ala Ser Asp Ile Ser Pro Pro Ala Leu
275 280 285

Glu Thr Ala Arg Lys Asn Ala Ala Asp Leu Gly Ala Arg Val Glu Phe
290 295 300

Ala His Gly Ser Trp Phe Asp Thr Asp Met Pro Ser Glu Gly Lys Trp

305 310 315 320
 Asp Ile Ile Val Ser Asn Pro Pro Tyr Ile Glu Asn Gly Asp Lys His
 325 330 335
 Leu Leu Gln Gly Asp Leu Arg Phe Glu Pro Gln Ile Ala Leu Thr Asp
 340 345 350
 Phe Ser Asp Gly Leu Ser Cys Ile Arg Thr Leu Ala Gln Gly Ala Pro
 355 360 365
 Asp Arg Leu Ala Glu Gly Gly Phe Leu Leu Leu Glu His Gly Phe Asp
 370 375 380
 Gln Gly Ala Ala Val Arg Gly Val Leu Ala Glu Asn Gly Phe Ser Gly
 385 390 395 400
 Val Glu Thr Leu Pro Asp Leu Ala Gly Leu Asp Arg Val Thr Leu Gly
 405 410 415
 Lys Tyr Met Lys His Leu Lys
 420

<210> 33
 <211> 1170
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0339 DNA sequence

<400> 33
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 atgggctggg ttgccgcccg cgtggatatg aaaaccgtat tgaagcaggc aaaaagcatc 120
 ccttcgggat tttataaaaag cttggacgct ttggctgacc gcaacagcgg gcgcgcggca 180
 agggagttag cggaagtcgt cgacggccgg ccgcaatcgt atgatttgaa cctcaccctc 240
 ggcaaaacttt accgccagcg tggcgaaaac gacaaaagcca tcaacataca ccggacaatg 300
 ctcgattctc ccgatacggg cggcgaaaaag cgcgcgcgcg tcctgtttga attggcgcaa 360
 aactacaaa gtgcgggggtt ggtcgatcgt gccgaacaga tttttttggg gctgcaagac 420
 ggtaaaatgg cgcgtgaagc cagacagcac ctgctcaata tctaccaaca ggacagggat 480
 tgggaaaaag cggttgaaac cgcccggctg ctcagccatg acgatcagac ctatcagttt 540
 gaaatcgccc agttttattg cgaacttgcc caagccgcgc tgttcaagtc caatttcgat 600
 gtgcgcggtt tcaatgtcgg caaggcactc gaagccaaca aaaaatgcac ccgcgccaac 660
 atgatttttg gcgacatcga acaccgacaa ggcaatttcc ctgccgccgt cgaagcctat 720
 gccgccatcg agcagcaaaa ccatgcatac ttgagcatgg tcggcgagaa gctttacgaa 780
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<210> 34
 <211> 389
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 <213> Neisseria meningitidis serogroup B NMB0339 protein sequence

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Val Leu Lys Gln Ala Lys Ser Ile Pro Ser Gly Phe Tyr Lys Ser Leu
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Asp Ala Leu Val Asp Arg Asn Ser Gly Arg Ala Ala Arg Glu Leu Ala
50 55 60
Glu Val Val Asp Gly Arg Pro Gln Ser Tyr Asp Leu Asn Leu Thr Leu
65 70 75 80
Gly Lys Leu Tyr Arg Gln Arg Gly Glu Asn Asp Lys Ala Ile Asn Ile
85 90 95
His Arg Thr Met Leu Asp Ser Pro Asp Thr Val Gly Glu Lys Arg Ala
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Arg Val Leu Phe Glu Leu Ala Gln Asn Tyr Gln Ser Ala Gly Leu Val
115 120 125
Asp Arg Ala Glu Gln Ile Phe Leu Gly Leu Gln Asp Gly Lys Met Ala
130 135 140
Arg Glu Ala Arg Gln His Leu Leu Asn Ile Tyr Gln Gln Asp Arg Asp
145 150 155 160
Trp Glu Lys Ala Val Glu Thr Ala Arg Leu Leu Ser His Asp Asp Gln
165 170 175
Thr Tyr Gln Phe Glu Ile Ala Gln Phe Tyr Cys Glu Leu Ala Gln Ala
180 185 190
Ala Leu Phe Lys Ser Asn Phe Asp Val Ala Arg Phe Asn Val Gly Lys
195 200 205
Ala Leu Glu Ala Asn Lys Lys Cys Thr Arg Ala Asn Met Ile Leu Gly
210 215 220
Asp Ile Glu His Arg Gln Gly Asn Phe Pro Ala Ala Val Glu Ala Tyr
225 230 235 240
Ala Ala Ile Glu Gln Gln Asn His Ala Tyr Leu Ser Met Val Gly Glu
245 250 255
Lys Leu Tyr Glu Ala Tyr Ala Ala Gln Gly Lys Pro Glu Glu Gly Leu
260 265 270
Asn Arg Leu Thr Gly Tyr Met Gln Thr Phe Pro Glu Leu Asp Leu Ile
275 280 285
Asn Val Val Tyr Glu Lys Ser Leu Leu Leu Lys Cys Glu Lys Glu Ala
290 295 300
Ala Gln Thr Ala Val Glu Leu Val Arg Arg Lys Pro Asp Leu Asn Gly
305 310 315 320
Val Tyr Arg Leu Leu Gly Leu Lys Leu Ser Asp Met Asn Pro Ala Trp
325 330 335
Lys Ala Asp Ala Asp Met Met Arg Ser Val Ile Gly Arg Gln Leu Gln
340 345 350

Arg Ser Val Met Tyr Arg Cys Arg Asn Cys His Phe Lys Ser Gln Val
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Phe Phe Trp His Cys Pro Ala Cys Asn Lys Trp Gln Thr Phe Thr Pro
 370 375 380

Asn Lys Ile Glu Val
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 <211> 3606
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0401 DNA sequence

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<210> 36

<211> 1201

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0401 protein sequence

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Gln	Arg	Ala	Gln	Met	Ser	Asp	Glu	Glu	Arg	Asn	Ala	Ala	Ser	Glu	Leu
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Ala	Arg	Arg	Leu	Val	Thr	Gln	Val	Arg	Ala	Gly	Arg	Thr	Lys	Ala	Gly
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Gly	Val	Asp	Ala	Leu	Met	His	Glu	Phe	Ser	Leu	Ser	Ser	Glu	Glu	Gly
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Ile	Ala	Leu	Met	Cys	Leu	Ala	Glu	Ala	Leu	Leu	Arg	Ile	Pro	Asp	Asn
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Ala	Thr	Arg	Asp	Arg	Leu	Ile	Ala	Asp	Lys	Ile	Ser	Asp	Gly	Asn	Trp
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Lys	Ser	His	Leu	Asn	Asn	Ser	Pro	Ser	Leu	Phe	Val	Asn	Ala	Ala	Ala
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Trp	Gly	Leu	Leu	Ile	Thr	Gly	Lys	Leu	Thr	Ala	Thr	Asn	Asp	Lys	Gln
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Met	Ser	Ser	Ala	Leu	Ser	Arg	Leu	Ile	Ser	Lys	Gly	Gly	Ala	Pro	Leu
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Ile	Arg	Gln	Gly	Val	Asn	Tyr	Ala	Met	Arg	Leu	Leu	Gly	Lys	Gln	Phe
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Val	Thr	Gly	Gln	Thr	Ile	Glu	Glu	Ala	Leu	Gln	Asn	Gly	Lys	Glu	Arg
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Glu	Lys	Met	Gly	Tyr	Arg	Phe	Ser	Phe	Asp	Met	Leu	Gly	Glu	Ala	Ala
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 225 230 235 240
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 245 250 255
 Thr Gln His Gly Arg Val Met Gly Glu Leu Leu Pro Arg Leu Lys Glu
 260 265 270
 Leu Phe Leu Leu Gly Lys Lys Tyr Asp Ile Gly Ile Asn Ile Asp Ala
 275 280 285
 Glu Glu Ala Asn Arg Leu Glu Leu Ser Leu Asp Leu Met Glu Ala Leu
 290 295 300
 Val Ser Asp Pro Asp Leu Ala Gly Tyr Lys Gly Ile Gly Phe Val Val
 305 310 315 320
 Gln Ala Tyr Gln Lys Arg Cys Pro Phe Val Ile Asp Tyr Leu Ile Asp
 325 330 335
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 340 345 350
 Ala Tyr Trp Asp Ser Glu Ile Lys Trp Ala Gln Val Asp Gly Leu Asn
 355 360 365
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 370 375 380
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 385 390 395 400
 Phe Ala Thr His Asn Ala Tyr Thr Leu Gly Ala Ile Tyr Gln Met Gly
 405 ~~410~~ 415
 Lys Gly Lys Asp Phe Glu His Gln Cys Leu His Gly Met Gly Glu Thr
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 435 440 445
 Val Tyr Ala Pro Val Gly Thr His Glu Thr Leu Leu Ala Tyr Leu Val
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 Arg Arg Leu Leu Glu Asn Gly Ala Asn Ser Ser Phe Val Asn Gln Ile
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 485 490 495
 Thr Ile Ala Glu Gln Gly Ile His Leu His Asn Ala Leu Pro Leu Pro
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 Arg Asp Leu Tyr Gly Lys Cys Arg Leu Asn Ser Gln Gly Val Asp Leu
 515 520 525
 Ser Asn Glu Asn Val Leu Gln Gln Leu Gln Glu Gln Met Asn Lys Ala

530	535	540
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Asp Val Gly Glu Ala Gln Pro Ile Lys 565 570	Asn Pro Ala Asp His Asp 575	
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Val Gly Ala Ala Val Ala Ala Phe Pro Glu Trp Ser 595 600 605	Ala Thr Pro Ala	
Ala Glu Arg Ala Ala Cys Leu Arg Arg Phe Ala Asp 610 615 620	Leu Leu Glu Gln	
His Thr Pro Ala Leu Met Met Leu Ala Val Arg 625 630 635	Glu Ala Gly Lys Thr 640	
Leu Asn Asn Ala Ile Ala Glu Val Arg Glu Ala Val Asp 645 650 655	Phe Cys Arg	
Tyr Tyr Ala Asn Glu Ala Glu His Thr Leu Pro Gln Asp 660 665 670	Ala Lys Ala	
Val Gly Ala Ile Val Ala Ile Ser Pro Trp Asn Phe Pro 675 680 685	Leu Ala Ile	
Phe Thr Gly Glu Val Val Ser Ala Leu Ala Ala Gly Asn Thr Val Ile 690 695 700		
Ala Lys Pro Ala Glu Gln Thr Ser Leu Ile Ala Gly Tyr Ala Val Ser 705 710 715 720		
Leu Met His Glu Ala Gly Ile Pro Thr Ser Ala Leu Gln Leu Val Leu 725 730 735		
Gly Ala Gly Asp Val Gly Ala Ala Leu Thr Asn Asp Ala Arg Ile Gly 740 745 750		
Gly Val Ile Phe Thr Gly Ser Thr Glu Val Ala Arg Leu Ile Asn Lys 755 760 765		
Ala Leu Ala Lys Arg Gly Asp Asn Pro Val Leu Ile Ala Glu Thr Gly 770 775 780		
Gly Gln Asn Ala Met Ile Val Asp Ser Thr Ala Leu Ala Glu Gln Val 785 790 795 800		
Cys Ala Asp Val Leu Asn Ser Ala Phe Asp Ser Ala Gly Gln Arg Cys 805 810 815		
Ser Ala Leu Arg Ile Leu Cys Val Gln Glu Asp Val Ala Asp Arg Met 820 825 830		
Leu Asp Met Ile Lys Gly Ala Met Asp Glu Leu Val Val Gly Lys Pro 835 840 845		
Ile Gln Leu Thr Thr Asp Val Gly Pro Val Ile Asp Ala Glu Ala Gln 850 855 860		

Gln Asn Leu Leu Asn His Ile Asn Lys Met Lys Gly Val Ala Lys Ser
 865 870 875 880
 Tyr His Glu Val Lys Thr Ala Ala Asp Val Asp Ser Lys Lys Ser Thr
 885 890 895
 Phe Val Arg Pro Ile Leu Phe Glu Leu Asn Asn Leu Asn Glu Leu Gln
 900 905 910
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 915 920 925
 Glu Leu Asp Asn Val Ile Asp Gln Ile Asn Ser Lys Gly Tyr Ala Leu
 930 935 940
 Thr His Gly Val His Ser Arg Ile Glu Gly Thr Val Arg His Ile Arg
 945 950 955 960
 Ser Arg Ile Glu Ala Gly Asn Val Tyr Val Asn Arg Asn Ile Val Gly
 965 970 975
 Ala Val Val Gly Val Gln Pro Phe Gly Gly His Gly Leu Ser Gly Thr
 980 985 990
 Gly Pro Lys Ala Gly Gly Ser Phe Tyr Leu Gln Lys Leu Thr Arg Ala
 995 1000 1005
 Gly Glu Trp Val Ala Pro Thr Leu Ser Gln Ile Gly Gln Ala Asp Glu
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 Ala Ala Leu Lys Arg Leu Glu Ala Leu Val His Lys Leu Pro Phe Asn
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 Arg Asn Ser Ile Ser Trp His Ala Pro Lys Arg Val Trp Ile His Gly
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 1090 1095 1100
 Gly Ile Gln Ala Val Val Glu Pro Asp Ser Pro Leu Ala Ser Tyr Thr
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 Ala Asp Leu Glu Gly Leu Leu Leu Val Asn Gly Lys Pro Glu Thr Ala
 1125 1130 1135
 Gly Ile Ser His Val Ala Ala Leu Ser Pro Leu Asp Ser Ala Arg Lys
 1140 1145 1150
 Gln Glu Leu Ala Ala His Asp Gly Ala Leu Ile Arg Ile Leu Pro Ser
 1155 1160 1165
 Glu Asn Gly Leu Asp Ile Leu Gln Val Phe Glu Glu Ile Ser Cys Ser
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Val Asn Thr Thr Ala Ala Gly Gly Asn Ala Ser Leu Met Ala Val Ala
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Asp

<210> 37
 <211> 1509
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB1467 DNA sequence

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 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB1467 protein sequence

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 35 40 45
 Arg Val Arg Ala Val Ala Thr Asn Thr Arg Val Ala Lys Asn Ala Asp
 50 55 60
 Lys Ala Ala Ala Gly Ala Gly Arg Ala Arg Tyr Thr Gly Val His Thr
 65 70 75 80
 Gly Gly Gly Lys Met Val Asp Gly Gly Gly Ser Thr Val Gly Ser Thr

<210> 40
 <211> 130
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 <213> Neisseria meningitidis serogroup B NMB2056 protein sequence

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 35 40 45
 Arg Gln Pro Leu Val Leu Thr Glu Asn Ala Glu Ser Phe Asp Ile Lys
 50 55 60
 Val Asn Val Val Gly Gly Gly Glu Thr Gly Gln Ser Gly Ala Ile Arg
 65 70 75 80
 His Gly Ile Thr Arg Ala Leu Ile Asp Phe Asp Ala Ala Leu Lys Pro
 85 90 95
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 Arg Lys Lys Pro Gly Leu Arg Lys Ala Arg Arg Ala Lys Gln Phe Ser
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 Lys Arg
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<210> 41
 <211> 567
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0808 DNA sequence

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<210> 42
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 <213> Neisseria meningitidis serogroup B NMB0808 protein sequence

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Asn Ile Ala Gly Leu Lys Leu Ala Gly Arg Ile Thr Glu Asp Gly Leu
 35 40 45
 Leu Ser Ala Gly Asn Gly Phe Ala Asp Thr Glu Ile Thr Phe Arg Asn
 50 55 60
 Ser Ala Val Gln Lys Ile Leu Gln Gly Gly Glu Pro Gly Ala Gly Asp
 65 70 75 80
 Ile Gly Leu Glu Gly Asp Leu Ile Leu Gly Ile Ala Val Leu Ser Leu
 85 90 95
 Leu Gly Ser Leu Arg Ser Arg Ala Ser Asp Glu Leu Ala Arg Ile Phe
 100 105 110
 Gly Thr Gln Ala Asp Ile Gly Ser Arg Ala Ala Asp Ile Gly His Gly
 115 120 125
 Ile Lys Gln Ile Gly Arg Asn Ile Ala Glu Gln Ile Gly Gly Phe Ser
 130 135 140
 Arg Glu Ser Glu Ser Ala Asn Ile Gly Asn Glu Ala Leu Ala Asp Cys
 145 150 155 160
 Leu Asp Glu Ile Ser Arg Leu Arg Asp Gly Val Glu Arg Leu Asn Glu
 165 170 175
 Arg Leu Asp Arg Leu Glu Arg Asp Ile Trp Ile Asp
 180 185

<210> 43
 <211> 627
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB0774 DNA sequence

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 gcggattgca gcacctacaa attccggacg cttgccaccg agctggcgcg cctgatggca 120
 tacgaggcaa gccgtgattt tgaaatcgaa aaatacctta tcgacggatg gtgcggtcag 180
 attgaaggcg accgcatcaa gggcaaaaaca ttgaccgtcg ttcccatact gcgtgcaggt 240
 ttgggtatgc ttgacggtgt gctcgacctg attccgactg ccaaaatcag tgtagtcgga 300
 ctgcagcgcg acgaagaaac gctgaagcct atttcctatt ttgagaaatt tgtggacagt 360
 atggacgaac gtccggcttt gattatcgat cctatgcttg cgacaggcgg ttcgatggtt 420
 gccaccatcg accttttgaa agccaagggc tgcaaaaata tcaaggcact ggtgctggtt 480
 gccgcgcccc aggggtgtgaa ggcggtcaac gacgcgcacc ctgacgttac gatttacacc 540
 gccgcgctcg acagccactt gaacgagaac ggctacatca tccccggctt gggcgatgcg 600
 ggcgacaaga ttttcggcac gcgctaa 627

<210> 44
 <211> 208
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0774 protein sequence

<400> 44
 Met Asn Val Asn Val Ile Asn His Pro Leu Val Arg His Lys Leu Thr
 1 5 10 15
 Leu Met Arg Glu Ala Asp Cys Ser Thr Tyr Lys Phe Arg Thr Leu Ala
 20 25 30

Thr Glu Leu Ala Arg Leu Met Ala Tyr Glu Ala Ser Arg Asp Phe Glu
 35 40 45
 Ile Glu Lys Tyr Leu Ile Asp Gly Trp Cys Gly Gln Ile Glu Gly Asp
 50 55 60
 Arg Ile Lys Gly Lys Thr Leu Thr Val Val Pro Ile Leu Arg Ala Gly
 65 70 75 80
 Leu Gly Met Leu Asp Gly Val Leu Asp Leu Ile Pro Thr Ala Lys Ile
 85 90 95
 Ser Val Val Gly Leu Gln Arg Asp Glu Glu Thr Leu Lys Pro Ile Ser
 100 105 110
 Tyr Phe Glu Lys Phe Val Asp Ser Met Asp Glu Arg Pro Ala Leu Ile
 115 120 125
 Ile Asp Pro Met Leu Ala Thr Gly Gly Ser Met Val Ala Thr Ile Asp
 130 135 140
 Leu Leu Lys Ala Lys Gly Cys Lys Asn Ile Lys Ala Leu Val Leu Val
 145 150 155 160
 Ala Ala Pro Glu Gly Val Lys Ala Val Asn Asp Ala His Pro Asp Val
 165 170 175
 Thr Ile Tyr Thr Ala Ala Leu Asp Ser His Leu Asn Glu Asn Gly Tyr
 180 185 190
 Ile Ile Pro Gly Leu Gly Asp Ala Gly Asp Lys Ile Phe Gly Thr Arg
 195 200 205

<210> 45
 <211> 657
 <212> DNA

<213> Neisseria meningitidis serogroup B-NMB0778 DNA sequence

<400> 45
 ttggcggttta ctttaatgcg tcgcgccatg atacgtaaaa tgccctatac ggaagatatg 60
 cgcccaggcg ataccgctaa tccttatggt gcgtccaaag cgatggtgga acggatgtta 120
 accgacatcc aaaaagccga tccgcgctgg agcatgattt tgttgcggtta tttcaatccg 180
 attggcgcgcg atgaaagcgg cttgattggc gagcagccaa acggcatccc gaataatttg 240
 ttgccttata tctgccaagt ggcggcaggc aaactgccgc aattggcggt atttggcgat 300
 gactacccta ccccgacgg cacggggatg cgtgactata ttcattgtgat ggatttggca 360
 gaaggccatg tcgcggctat gcaggcaaaa agtaattgtag caggcacgca tttgctgaac 420
 ttaggctccg gccgcgcttc ttcggtgttg gaaatcatcc gcgcatttga agcagcttcg 480
 ggtttgaaga ttccgtatga agtcaaaccg cgccgtgccg gtgatttggc gtgcttctat 540
 gccgaccctt cctatacaaa ggcgcaaata ggctggcaaa cccagcgtga ttttaaccctaa 600
 atgatggaag actcatggcg ctgggtgagt aataatccga atggctacga cgattaa 657

<210> 46
 <211> 218
 <212> PRT

<213> Neisseria meningitidis serogroup B NMB0778 protein sequence

<400> 46
 Met Ala Phe Thr Leu Met Arg Arg Ala Met Ile Arg Lys Met Pro Tyr
 1 5 10 15

Thr Glu Asp Met Arg Pro Gly Asp Thr Ala Asn Pro Tyr Gly Ala Ser
 20 25 30
 Lys Ala Met Val Glu Arg Met Leu Thr Asp Ile Gln Lys Ala Asp Pro
 35 40 45
 Arg Trp Ser Met Ile Leu Leu Arg Tyr Phe Asn Pro Ile Gly Ala His
 50 55 60
 Glu Ser Gly Leu Ile Gly Glu Gln Pro Asn Gly Ile Pro Asn Asn Leu
 65 70 75 80
 Leu Pro Tyr Ile Cys Gln Val Ala Ala Gly Lys Leu Pro Gln Leu Ala
 85 90 95
 Val Phe Gly Asp Asp Tyr Pro Thr Pro Asp Gly Thr Gly Met Arg Asp
 100 105 110
 Tyr Ile His Val Met Asp Leu Ala Glu Gly His Val Ala Ala Met Gln
 115 120 125
 Ala Lys Ser Asn Val Ala Gly Thr His Leu Leu Asn Leu Gly Ser Gly
 130 135 140
 Arg Ala Ser Ser Val Leu Glu Ile Ile Arg Ala Phe Glu Ala Ala Ser
 145 150 155 160
 Gly Leu Thr Ile Pro Tyr Glu Val Lys Pro Arg Arg Ala Gly Asp Leu
 165 170 175
 Ala Cys Phe Tyr Ala Asp Pro Ser Tyr Thr Lys Ala Gln Ile Gly Trp
 180 185 190
 Gln Thr Gln Arg Asp Leu Thr Gln Met Met Glu Asp Ser Trp Arg Trp
 195 200 205
 Val Ser Asn Asn Pro Asn Gly Tyr Asp Asp
 210 215

<210> 47

<211> 999

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0337 DNA sequence

<400> 47

atgagcagac	ccgtaccgcg	cgtattcggc	agcgtttttc	acagtcaa	gcccgtcctc	60
gcctaccgcg	aaggcaaatg	gcagccgacc	gaatggcaat	cttcccaaga	cctctccctc	120
gcaccggg	cgcacgcct	gcactacggc	agcgaatgtt	tcgagggact	gaaagccttc	180
cgtcaggcag	acggcaaaat	cgtgctgttc	cgtcgcgactg	ccaatatcgc	gcgtatgcgg	240
caaagtgcgg	acattttgca	cctgccgcgc	cccgaaccgc	aagcttatct	tgacgcgcta	300
atcaaatgg	tcaaactg	cgccgatgaa	attcccgatg	cgcctgccgc	cctgtacctg	360
cgtccgacct	taatcggtac	cgatcccggt	atcggcaagg	ccggttctcc	ttccgaaacc	420
gcctgtctgt	atattttggc	ttcccccgtc	ggcgactatt	tcaaagtcgg	atcgcccgtc	480
aaaattttgg	tggaaaccga	acacatccgc	tgcgccccgc	atatgggccg	cgtcaaatgc	540
ggcggaact	acgcttcgc	catgcaactg	gtgctgaagg	cgaaagccga	atatggcgca	600
aatcaagtcc	tggtctgccc	gaacggcgac	gtgcaggaaa	ccggcgcgtc	caactttatc	660
ctgattaacg	gcgatgaaat	cattaccaa	ccgctgaccg	acgagttttt	gcacggcgta	720
acccgcgatt	ccgtactgac	ggttgcaaaa	gatttgggct	ataccgtcag	cgaacgcaat	780
ttcacgggtg	acgaactcaa	agctgcgggtg	gaaaacgggtg	cggaagccat	tttgaccggt	840
acggcagccg	tcattctgcc	cgttacttcc	ttcgtcatcg	gcggcaaaga	aatcgaagtg	900
aaaagccaag	aacgcggcta	tgccatccgt	aaggcgatta	ccgacatcca	gtatggtttg	960

gcggaagaca aatacggctg gctggttgaa gtgtgctga

999

<210> 48

<211> 332

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0337 protein sequence

<400> 48

Met Ser Arg Pro Val Pro Ala Val Phe Gly Ser Val Phe His Ser Gln
1 5 10 15

Met Pro Val Leu Ala Tyr Arg Glu Gly Lys Trp Gln Pro Thr Glu Trp
20 25 30

Gln Ser Ser Gln Asp Leu Ser Leu Ala Pro Gly Ala His Ala Leu His
35 40 45

Tyr Gly Ser Glu Cys Phe Glu Gly Leu Lys Ala Phe Arg Gln Ala Asp
50 55 60

Gly Lys Ile Val Leu Phe Arg Pro Thr Ala Asn Ile Ala Arg Met Arg
65 70 75 80

Gln Ser Ala Asp Ile Leu His Leu Pro Arg Pro Glu Thr Glu Ala Tyr
85 90 95

Leu Asp Ala Leu Ile Lys Leu Val Lys Arg Ala Ala Asp Glu Ile Pro
100 105 110

Asp Ala Pro Ala Ala Leu Tyr Leu Arg Pro Thr Leu Ile Gly Thr Asp
115 120 125

Pro Val Ile Gly Lys Ala Gly Ser Pro Ser Glu Thr Ala Leu Leu Tyr
130 135 140

Ile Leu Ala Ser Pro Val Gly Asp Tyr Phe Lys Val Gly Ser Pro Val
145 150 155 160

Lys Ile Leu Val Glu Thr Glu His Ile Arg Cys Ala Pro His Met Gly
165 170 175

Arg Val Lys Cys Gly Gly Asn Tyr Ala Ser Ala Met His Trp Val Leu
180 185 190

Lys Ala Lys Ala Glu Tyr Gly Ala Asn Gln Val Leu Phe Cys Pro Asn
195 200 205

Gly Asp Val Gln Glu Thr Gly Ala Ser Asn Phe Ile Leu Ile Asn Gly
210 215 220

Asp Glu Ile Ile Thr Lys Pro Leu Thr Asp Glu Phe Leu His Gly Val
225 230 235 240

Thr Arg Asp Ser Val Leu Thr Val Ala Lys Asp Leu Gly Tyr Thr Val
245 250 255

Ser Glu Arg Asn Phe Thr Val Asp Glu Leu Lys Ala Ala Val Glu Asn
260 265 270

Gly Ala Glu Ala Ile Leu Thr Gly Thr Ala Ala Val Ile Ser Pro Val
275 280 285

Thr Ser Phe Val Ile Gly Gly Lys Glu Ile Glu Val Lys Ser Gln Glu
 290 295 300

Arg Gly Tyr Ala Ile Arg Lys Ala Ile Thr Asp Ile Gln Tyr Gly Leu
 305 310 315 320

Ala Glu Asp Lys Tyr Gly Trp Leu Val Glu Val Cys
 325 330

<210> 49

<211> 774

<212> DNA

<213> Neisseria meningitidis serogroup B NMB0191 DNA sequence

<400> 49

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acggtaaatt	tggcggcttc	gctggcatcg	cgcgggcaaac	gcgtgctggt	ggtcgatttg	120
gatccgcagg	gcaatgcgac	gacgggcagc	ggcatcgaca	aggcgggttt	gcagtccggc	180
gtttatcagg	tcttattggg	cgatgcgga	gtgcagtcgg	cggcgggtacg	cagcaaagag	240
ggcggatacg	ctgtgttggg	tgcgaaccgc	gcgctggccg	gcgcggaaat	cgaactggtg	300
caggaaatcg	cccgggaagt	gcgtttgaaa	aacgcgctca	aggcagtgga	agaagattac	360
gactttatcc	tgatcgactg	cccgccttcg	ctgacgctgt	tgacgcttaa	cgggctggtg	420
gcggcgggcg	gcgtgattgt	gccgatgttg	tgccaatatt	acgcgctgga	agggatttcc	480
gatttgattg	cgaccgtgcg	caaaatccgt	caggcggtca	atcccgaattt	ggacatcacg	540
ggcatcgtgc	gcacgatgta	cgacagccgc	agcaggctgg	ttgccgaagt	cagcgaacag	600
ttgcgcagcc	atttcgggga	tttgcttttt	gaaaccgtca	tcccgcgcaa	tatccgcctt	660
gcggaagcgc	cgagccacgg	tatgcgggtg	atggcttacg	acgcgcaggg	aaagggtacc	720
aaggcgtatc	ttgccttggc	ggacgagctg	gcggcgaggg	tgtcggggaa	atag	774

<210> 50

<211> 257

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0191 protein sequence

<400> 50

Met	Ser	Ala	Asn	Ile	Leu	Ala	Ile	Ala	Asn	Gln	Lys	Gly	Gly	Val	Gly	
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Lys	Thr	Thr	Thr	Thr	Val	Asn	Leu	Ala	Ala	Ser	Leu	Ala	Ser	Arg	Gly	
			20					25					30			
Lys	Arg	Val	Leu	Val	Val	Asp	Leu	Asp	Pro	Gln	Gly	Asn	Ala	Thr	Thr	
		35					40					45				
Gly	Ser	Gly	Ile	Asp	Lys	Ala	Gly	Leu	Gln	Ser	Gly	Val	Tyr	Gln	Val	
		50				55					60					
Leu	Leu	Gly	Asp	Ala	Asp	Val	Gln	Ser	Ala	Ala	Val	Arg	Ser	Lys	Glu	
		65			70					75					80	
Gly	Gly	Tyr	Ala	Val	Leu	Gly	Ala	Asn	Arg	Ala	Leu	Ala	Gly	Ala	Glu	
			85					90						95		
Ile	Glu	Leu	Val	Gln	Glu	Ile	Ala	Arg	Glu	Val	Arg	Leu	Lys	Asn	Ala	
			100					105						110		
Leu	Lys	Ala	Val	Glu	Glu	Asp	Tyr	Asp	Phe	Ile	Leu	Ile	Asp	Cys	Pro	
		115					120						125			
Pro	Ser	Leu	Thr	Leu	Leu	Thr	Leu	Asn	Gly	Leu	Val	Ala	Ala	Gly	Gly	

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<210> 52
<211> 444
<212> PRT
<213> Neisseria meningitidis serogroup B NMB1710 protein sequence
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<400> 52
Met Thr Asp Leu Asn Thr Leu Phe Ala Asn Leu Lys Gln Arg Asn Pro
1 5 10 15
Asn Gln Glu Pro Phe His Gln Ala Val Glu Glu Val Phe Met Ser Leu
20 25 30
Asp Pro Phe Leu Ala Lys Asn Pro Lys Tyr Thr Gln Gln Ser Leu Leu
35 40 45
Glu Arg Ile Val Glu Pro Glu Arg Val Val Met Phe Arg Val Thr Trp
50 55 60
Gln Asp Asp Lys Gly Gln Val Gln Val Asn Arg Gly Tyr Arg Val Gln
65 70 75 80
Met Ser Ser Ala Ile Gly Pro Tyr Lys Gly Gly Leu Arg Phe His Pro
85 90 95
Thr Val Asp Leu Gly Val Leu Lys Phe Leu Ala Phe Glu Gln Val Phe
100 105 110
Lys Asn Ala Leu Thr Thr Leu Pro Met Gly Gly Gly Lys Gly Gly Ser
115 120 125
Asp Phe Asp Pro Lys Gly Lys Ser Asp Ala Glu Val Met Arg Phe Cys
130 135 140
Gln Ala Phe Met Thr Glu Leu Tyr Arg His Ile Gly Ala Asp Thr Asp
145 150 155 160
Val Pro Ala Gly Asp Ile Gly Val Gly Gly Arg Glu Ile Gly Tyr Leu
165 170 175
Phe Gly Gln Tyr Lys Lys Ile Arg Asn Glu Phe Ser Ser Val Leu Thr
180 185 190
Gly Lys Gly Leu Glu Trp Gly Gly Ser Leu Ile Arg Pro Glu Ala Thr
195 200 205
Gly Tyr Gly Cys Val Tyr Phe Ala Gln Ala Met Leu Gln Thr Arg Asn
210 215 220
Asp Ser Phe Glu Gly Lys Arg Val Leu Ile Ser Gly Ser Gly Asn Val
225 230 235 240
Ala Gln Tyr Ala Ala Glu Lys Ala Ile Gln Leu Gly Ala Lys Val Leu
245 250 255
Thr Val Ser Asp Ser Asn Gly Phe Val Leu Phe Pro Asp Ser Gly Met
260 265 270
Thr Glu Ala Gln Leu Ala Ala Leu Ile Glu Leu Lys Glu Val Arg Arg
275 280 285
Glu Arg Val Ala Thr Tyr Ala Lys Glu Gln Gly Leu Gln Tyr Phe Glu
290 295 300
Lys Gln Lys Pro Trp Gly Val Ala Ala Glu Ile Ala Leu Pro Cys Ala
305 310 315 320

Thr Gln Asn Glu Leu Asp Glu Glu Ala Ala Lys Thr Leu Leu Ala Asn
 325 330 335
 Gly Cys Tyr Val Val Ala Glu Gly Ala Asn Met Pro Ser Thr Leu Gly
 340 345 350
 Ala Val Glu Gln Phe Ile Lys Ala Gly Ile Leu Tyr Ala Pro Gly Lys
 355 360 365
 Ala Ser Asn Ala Gly Gly Val Ala Thr Ser Gly Leu Glu Met Ser Gln
 370 375 380
 Asn Ala Ile Arg Leu Ser Trp Thr Arg Glu Glu Val Asp Gln Arg Leu
 385 390 395 400
 Phe Gly Ile Met Gln Ser Ile His Glu Ser Cys Leu Lys Tyr Gly Lys
 405 410 415
 Val Gly Asp Thr Val Asn Tyr Val Asn Gly Ala Asn Ile Ala Gly Phe
 420 425 430
 Val Lys Val Ala Asp Ala Met Leu Ala Gln Gly Phe
 435 440

<210> 53
 <211> 867
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB0062 DNA sequence

<400> 53
 Ala Thr Gly Ala Ala Ala Gly Gly Cys Ala Thr Cys Ala Thr Ala Cys
 1 5 10 15
 Thr Gly Gly Cys Ala Gly Gly Cys Gly Gly Cys Ala Gly Cys Gly Gly
 20 25 30
 Cys Ala Cys Gly Cys Gly Cys Cys Thr Cys Thr Ala Cys Cys Cys Cys
 35 40 45
 Ala Thr Cys Ala Cys Gly Cys Gly Cys Gly Gly Cys Gly Thr Ala Thr
 50 55 60
 Cys Cys Ala Ala Ala Cys Ala Gly Cys Thr Cys Cys Thr Gly Cys Cys
 65 70 75 80
 Cys Gly Thr Gly Thr Ala Cys Gly Ala Cys Ala Ala Ala Cys Cys Gly
 85 90 95
 Ala Thr Gly Ala Thr Thr Thr Ala Thr Thr Ala Cys Cys Cys Cys Thr
 100 105 110
 Thr Gly Thr Cys Gly Gly Thr Thr Thr Thr Gly Ala Thr Gly Cys Thr
 115 120 125
 Gly Gly Cys Gly Gly Gly Ala Ala Thr Cys Cys Gly Cys Gly Ala Thr
 130 135 140
 Ala Thr Thr Thr Thr Gly Gly Thr Gly Ala Thr Thr Ala Cys Cys Gly
 145 150 155 160
 Cys Gly Cys Cys Thr Gly Ala Ala Gly Ala Cys Ala Ala Cys Gly Cys

	165		170		175
Cys Thr Cys Thr Thr Thr Cys Ala Ala Ala Cys Gly Cys Cys Thr Gly	180	185		190	
Cys Thr Thr Gly Gly Cys Gly Ala Cys Gly Gly Cys Ala Gly Cys Gly	195	200		205	
Ala Thr Thr Thr Cys Gly Gly Cys Ala Thr Thr Thr Cys Cys Ala Thr	210	215		220	
Cys Ala Gly Thr Thr Ala Thr Gly Cys Cys Gly Thr Gly Cys Ala Ala	225	230		235	240
Cys Cys Cys Ala Gly Thr Cys Cys Gly Gly Ala Cys Gly Gly Cys Thr	245	250		255	
Thr Gly Gly Cys Ala Cys Ala Gly Gly Cys Ala Thr Thr Thr Ala Thr	260	265		270	
Cys Ala Thr Cys Gly Gly Cys Gly Ala Ala Gly Ala Ala Thr Thr Thr	275	280		285	
Ala Thr Cys Gly Gly Cys Ala Ala Cys Gly Ala Cys Ala Ala Thr Gly	290	295		300	
Thr Thr Thr Gly Cys Thr Thr Gly Gly Thr Thr Thr Thr Gly Gly Gly	305	310		315	320
Cys Gly Ala Cys Ala Ala Thr Ala Thr Thr Thr Thr Thr Thr Ala Cys	325	330		335	
Gly Gly Thr Cys Ala Gly Thr Cys Gly Thr Thr Thr Thr Ala Cys Gly Cys	340	345		350	
Ala Ala Ala Cys Ala Thr Thr Gly Ala Ala Ala Cys Ala Gly Gly Cys	355	360		365	
Gly Gly Cys Ala Gly Cys Gly Cys Ala Ala Ala Cys Gly Cys Ala Cys	370	375		380	
Gly Gly Cys Gly Cys Ala Ala Cys Cys Gly Thr Gly Thr Thr Thr Gly	385	390		395	400
Cys Thr Thr Ala Thr Cys Ala Gly Gly Thr Cys Ala Ala Ala Ala Ala	405	410		415	
Cys Cys Cys Cys Gly Ala Ala Cys Gly Thr Thr Thr Cys Gly Gly Cys	420	425		430	
Gly Thr Gly Gly Thr Thr Gly Ala Ala Thr Thr Thr Ala Ala Cys Gly	435	440		445	
Ala Ala Ala Ala Cys Thr Thr Cys Cys Gly Cys Gly Cys Cys Gly Thr	450	455		460	
Thr Thr Cys Cys Ala Thr Cys Gly Ala Ala Gly Ala Ala Ala Ala Ala	465	470		475	480
Cys Cys Gly Cys Ala Ala Cys Gly Gly Cys Cys Cys Ala Ala Ala Thr	485	490		495	

Cys Cys Gly Ala Thr Thr Gly Gly Gly Cys Gly Gly Thr Ala Ala Cys
 500 505 510
 Cys Gly Gly Cys Thr Thr Gly Thr Ala Thr Thr Thr Cys Thr Ala Cys
 515 520 525
 Gly Ala Cys Ala Ala Cys Cys Gly Cys Gly Cys Cys Gly Thr Cys Gly
 530 535 540
 Ala Gly Thr Thr Cys Gly Cys Cys Ala Ala Ala Cys Ala Gly Cys Thr
 545 550 555 560
 Cys Ala Ala Ala Cys Cys Gly Thr Cys Cys Gly Cys Ala Cys Gly Cys
 565 570 575
 Gly Gly Cys Gly Ala Ala Thr Thr Gly Gly Ala Ala Ala Thr Thr Ala
 580 585 590
 Cys Cys Gly Ala Cys Cys Thr Cys Ala Ala Cys Cys Gly Gly Ala Thr
 595 600 605
 Gly Thr Ala Thr Thr Thr Gly Gly Ala Ala Gly Ala Cys Gly Gly Cys
 610 615 620
 Thr Cys Gly Cys Thr Cys Thr Cys Cys Gly Thr Thr Cys Ala Ala Ala
 625 630 635 640
 Thr Ala Thr Thr Gly Gly Gly Ala Cys Gly Cys Gly Gly Thr Thr Thr
 645 650 655
 Cys Gly Cys Gly Thr Gly Gly Cys Thr Gly Gly Ala Cys Ala Cys Cys
 660 665 670
 Gly Gly Cys Ala Cys Cys Cys Ala Cys Gly Ala Gly Ala Gly Cys Cys
 675 680 685
 Thr Gly Cys Ala Cys Gly Ala Ala Gly Cys Cys Gly Cys Thr Thr Cys
 690 695 700
 Ala Thr Thr Cys Gly Thr Cys Cys Ala Ala Ala Cys Cys Gly Thr Gly
 705 710 715 720
 Cys Ala Ala Ala Ala Thr Ala Thr Cys Cys Ala Ala Ala Ala Cys Cys
 725 730 735
 Thr Gly Cys Ala Cys Ala Thr Cys Gly Cys Cys Thr Gly Cys Cys Thr
 740 745 750
 Cys Gly Ala Ala Gly Ala Ala Ala Thr Cys Gly Cys Thr Thr Gly Gly
 755 760 765
 Cys Gly Cys Ala Ala Cys Gly Gly Thr Thr Gly Gly Cys Thr Thr Thr
 770 775 780
 Cys Cys Gly Ala Thr Gly Ala Ala Ala Ala Ala Cys Thr Gly Gly Ala
 785 790 795 800
 Ala Gly Ala Ala Thr Thr Gly Gly Cys Gly Cys Gly Cys Cys Cys Gly
 805 810 815

Ala Thr Gly Gly Cys Gly Ala Ala Ala Ala Cys Cys Ala Ala Thr
820 825 830

Ala Cys Gly Gly Cys Cys Ala Ala Thr Ala Thr Thr Thr Gly Cys Thr
835 840 845

Gly Cys Gly Cys Cys Thr Gly Thr Thr Gly Ala Ala Ala Ala Ala Ala
850 855 860

Thr Ala Ala
865

<210> 54

<211> 288

<212> PRT

<213> Neisseria meningitidis serogroup B NMB0062 protein sequence

<400> 54

Met Lys Gly Ile Ile Leu Ala Gly Gly Ser Gly Thr Arg Leu Tyr Pro
1 5 10 15

Ile Thr Arg Gly Val Ser Lys Gln Leu Leu Pro Val Tyr Asp Lys Pro
20 25 30

Met Ile Tyr Tyr Pro Leu Ser Val Leu Met Leu Ala Gly Ile Arg Asp
35 40 45

Ile Leu Val Ile Thr Ala Pro Glu Asp Asn Ala Ser Phe Lys Arg Leu
50 55 60

Leu Gly Asp Gly Ser Asp Phe Gly Ile Ser Ile Ser Tyr Ala Val Gln
65 70 75 80

Pro Ser Pro Asp Gly Leu Ala Gln Ala Phe Ile Ile Gly Glu Glu Phe
85 90 95

Ile Gly Asn Asp Asn Val Cys Leu Val Leu Gly Asp Asn Ile Phe Tyr
100 105 110

Gly Gln Ser Phe Thr Gln Thr Leu Lys Gln Ala Ala Ala Gln Thr His
115 120 125

Gly Ala Thr Val Phe Ala Tyr Gln Val Lys Asn Pro Glu Arg Phe Gly
130 135 140

Val Val Glu Phe Asn Glu Asn Phe Arg Ala Val Ser Ile Glu Glu Lys
145 150 155 160

Pro Gln Arg Pro Lys Ser Asp Trp Ala Val Thr Gly Leu Tyr Phe Tyr
165 170 175

Asp Asn Arg Ala Val Glu Phe Ala Lys Gln Leu Lys Pro Ser Ala Arg
180 185 190

Gly Glu Leu Glu Ile Thr Asp Leu Asn Arg Met Tyr Leu Glu Asp Gly
195 200 205

Ser Leu Ser Val Gln Ile Leu Gly Arg Gly Phe Ala Trp Leu Asp Thr
210 215 220

Gly Thr His Glu Ser Leu His Glu Ala Ala Ser Phe Val Gln Thr Val

225 230 235 240

Gln Asn Ile Gln Asn Leu His Ile Ala Cys Leu Glu Glu Ile Ala Trp
 245 250 255

Arg Asn Gly Trp Leu Ser Asp Glu Lys Leu Glu Glu Leu Ala Arg Pro
 260 265 270

Met Ala Lys Asn Gln Tyr Gly Gln Tyr Leu Leu Arg Leu Leu Lys Lys
 275 280 285

<210> 55
 <211> 918
 <212> DNA
 <213> Neisseria meningitidis serogroup B NMB1583 DNA sequence

<400> 55
 atgaatttga ctaaaacaca acgccaactg cacaactttc tgaccctcgc ccaagaagca 60
 gggtcgtgt ccaagctcgc caaactctgc ggctaccgta ccccgctcgc actctacaaa 120
 ctcaaaacac gccttgaaaa gcaggcagaa gacccagatg cagcgggcat ccgtcccagc 180
 ctgatggcaa aactcgaaaa acacaccggc aaacccaaaag gctgggtcga cagaaaaacac 240
 cgcgaacgca ctgtccccga aaccgcccga gaaagcaccg gaactgccga aacccaaatt 300
 gccgaaaccg catctgctgc cggtgcccgc agcgttaccg tcaaccgcaa tacctgcgaa 360
 acccaaatca ccgtctccat caacctcgac ggacgcggca aaagcaggct ggataccggc 420
 gtacccttcc tcgaacacat gatcgatcaa atcgcccgcc acggcatgat tgacatcgac 480
 atcagctgca aaggcgacct gcacatcgac gaccaccaca ccgccgaaga catcggcatc 540
 aactcggac aagcaatccg gcaggcactc ggcgacaaaa aaggcatccg ccgttacgga 600
 cattcctacg tcccgtcoga cgaagccctc agccgcgtcg tcatcgacct ttccggccgc 660
 cccggactcg tgtacaacat cgaatttacc cgcgactaa tcggacgttt cgatgtcgat 720
 ttgtttgaag aatttttcca cggcatcgtc aaccacagta tgatgacct gcacatcgac 780
 aacctcagcg gcaaaaacgc ccaccatcag gcgaaaaccg tattcaaagc cttcggggcg 840
 gccctgcgta tggcagtcga acacgacccg cgcattggcag gacagacccc ctcgaccaa 900
 ggcacgctga ccgcataa 918

<210> 56
 <211> 305
 <212> PRT
 <213> Neisseria meningitidis serogroup B NMB1583 protein sequence

<400> 56
 Met Asn Leu Thr Lys Thr Gln Arg Gln Leu His Asn Phe Leu Thr Leu
 1 5 10 15

Ala Gln Glu Ala Gly Ser Leu Ser Lys Leu Ala Lys Leu Cys Gly Tyr
 20 25 30

Arg Thr Pro Val Ala Leu Tyr Lys Leu Lys Gln Arg Leu Glu Lys Gln
 35 40 45

Ala Glu Asp Pro Asp Ala Arg Gly Ile Arg Pro Ser Leu Met Ala Lys
 50 55 60

Leu Glu Lys His Thr Gly Lys Pro Lys Gly Trp Leu Asp Arg Lys His
 65 70 75 80

Arg Glu Arg Thr Val Pro Glu Thr Ala Ala Glu Ser Thr Gly Thr Ala
 85 90 95

Glu Thr Gln Ile Ala Glu Thr Ala Ser Ala Ala Gly Cys Arg Ser Val
 100 105 110

Thr Val Asn Arg Asn Thr Cys Glu Thr Gln Ile Thr Val Ser Ile Asn
 115 120 125
 Leu Asp Gly Ser Gly Lys Ser Arg Leu Asp Thr Gly Val Pro Phe Leu
 130 135 140
 Glu His Met Ile Asp Gln Ile Ala Arg His Gly Met Ile Asp Ile Asp
 145 150 155 160
 Ile Ser Cys Lys Gly Asp Leu His Ile Asp Asp His His Thr Ala Glu
 165 170 175
 Asp Ile Gly Ile Thr Leu Gly Gln Ala Ile Arg Gln Ala Leu Gly Asp
 180 185 190
 Lys Lys Gly Ile Arg Arg Tyr Gly His Ser Tyr Val Pro Leu Asp Glu
 195 200 205
 Ala Leu Ser Arg Val Val Ile Asp Leu Ser Gly Arg Pro Gly Leu Val
 210 215 220
 Tyr Asn Ile Glu Phe Thr Arg Ala Leu Ile Gly Arg Phe Asp Val Asp
 225 230 235 240
 Leu Phe Glu Glu Phe Phe His Gly Ile Val Asn His Ser Met Met Thr
 245 250 255
 Leu His Ile Asp Asn Leu Ser Gly Lys Asn Ala His His Gln Ala Glu
 260 265 270
 Thr Val Phe Lys Ala Phe Gly Arg Ala Leu Arg Met Ala Val Glu His
 275 280 285
 Asp Pro Arg Met Ala Gly Gln Thr Pro Ser Thr Lys Gly Thr Leu Thr
 290 295 300

Ala
 305

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- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
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